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A screw driver is all you need to take a Masterphone apart. Two screws hold the entire switch assembly in place. There are no direct cord connections to the receiver or transmitter. They drop freely into your hand when the caps are removed. No chance for damage or improper connections to them.

Once you've tried a 710 Masterphone with a 610 box you won't want to go back to the ordinary handset. Order one today, and see what a difference there is.

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WITH THE ONLY REAL NON-POSITIONAL TRANSMITTER AND TRIAD BALANCED CIRCUIT

Telephone Engineer

The International Technical Journal

Founded in 1909

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What They Say About Your Business

Says a recent issue of the magazine Commerce, in the course of an article on communication service in this country:

"With all its monopolistic character, the telephone has been the most democratic of all blessings because it has connected and made neighbors of towns, states and nations, it has broadened the lives of millions upon millions of people, it has furnished employment to armies of workers, it has been the sustenance of a branch of science enriching our standard of living, and its profits have been open to anybody who chose to share them. It has been the means of simplifying and expediting the growth of all other business by the facility with which it has made individuals accessible to all other individuals. It has changed the standards of acquaintance, friendship and communion between men."

A wonderful testimonial for a newspaper advertisement, handbill, bill enclosure or any type of telephone advertising. Use it.

R. C. R.

THE 10% THEY SEE

LESS than 10% of your entire plant investment is in the telephone instruments on your subscribers' premises . . . but those instruments are the only part of your entire equipment the average subscriber sees.

How important it is that this equipment be kept up-to-date. Nothing is better suited to the purpose than the *new* Stromberg-Carlson 1191 Handset. It is a one-piece handset with ringer, induction coil and condenser mounted in the base. It completely does away with the unsightly desk set box.

The 1191 Handset is attractive in appearance and comfortable to use. The instrument costs you less money for equipment, installation and maintenance than the 2-piece set and at the same time brings you the added revenue of handset service. It establishes new standards in transmission and reception qualities.

Order a sample. Test it under your most exacting requirements. You will then realize what a wonderful builder of good will this instrument is.

Stromberg-Carlson 1191 Handset . . . ringer, induction coil and condenser mounted in base of instrument, making it completely self-contained and doing away with desk set box.

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MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR MORE THAN THIRTY-FIVE YEARS

EDITORIAL

Selling the Modern Hand Set

Telephone men are recognizing the fact that to keep abreast of modern salesmanship they must supply their subscribers with up-to-date telephone equipment. It has taken a long time to convince operating men that if they are to get their share of the dollars spent they must sell products having the most sales appeal—and to go out and sell them by the same modern merchandising used by their competitors. Perhaps the most recent and effective movement to sell more telephones is the increased effort by wide-awake telephone companies to merchandise hand set telephones. The hand set is one of those telephone products having sales appeal—it has beauty, individuality, it is streamlined, and there never was an item so necessary to the life and happiness of people.

Of course, the telephone man's argument against standardizing on hand sets is, "why should I 'junk' my desk stands which will still give service." The answer is a point of modern selling. Does the telephone man stop to realize that the modern hand set will give better service and if he adopts modern selling methods and creates a desire for the hand set he probably will put more telephones back into service than if he used the old worn out sales tactics to sell the old fashioned desk stand. Times have changed. People are not going to put back their telephones voluntarily as rapidly as they have in the past. Wide-awake local merchants are going to get their money, by selling products with no more sales appeal than the hand set telephone. *Telephone Engineer* repeats — telephones must be sold today.

A manufacturer brings out a good reason why hand sets should be sold when he says "that less than 10 per cent of the entire telephone plant investment is in the telephone instruments on subscribers' premises and those instruments are the only part of the entire telephone equipment the average subscriber sees. How important that this equipment be kept up-to-date." There is logic in this thought. If the subscriber's telephone is of the old vintage he assumes the entire telephone plant is of the old vintage also. However, if his telephone is modern and up-to-date, he assumes the whole plant is modern and up-to-date. In other words, the subscriber is influenced in his judgment of how good the telephone plant and service is by the appearance of the 10 per cent of the plant he sees. While appearance is important, so is service, but good appearance and good service combined increase customer satisfaction, making the telephone selling job that much easier.

- Meet Your Competitors
- Has Sales Appeal
- Times Have Changed
- Subscribers See 10%
- Make the Job Easier

R. C. Rees

EDITOR

The Telephone Business As We See It

Investors

Investors in public utility securities have the State of Massachusetts to thank for one of the most cheerful items of news they have been privileged to read in many years. The Department of Public Utilities of that state, famous for its "prudent investment theories," has dismissed a petition for reduction in certain rates of the Lynn Gas & Electric Co. with a decision which, if followed in other states, would dispose of most of the present complexities of the utility situation.

Boiled down, the department said:

Prices of public utility services should not rise and fall with prices of other commodities.

There is no more reason to expect rates to be reduced in times of depression than to expect a like reduction in taxes.

The per cent of dividends paid on capital stock is no criterion of their reasonableness.

Allowance should be made for intelligent management and for risk of capital employed.

The commission also made a comparison of what the results might have been had the Lynn company been municipally operated and found that under such operation, making adjustment for taxes, there would have been a loss to the public of $295,000.—*Investors' Review.*

▲ ▲ ▲

Office Seekers

Telephone men should be most active today in getting the views and opinions of national and state political candidates relative to the telephone industry.

It is the duty of every member of the industry to single out his choice candidates and see how they stand on legislation and public utilities.

It should be pointed out to them that the telephone industry has nothing to hide from political investigators and that the industry is not asking for any special privileges. It only asks to be left to work out its problems in its own way, without help or hindrance of politicians who know no more about the telephone business than the telephone man knows about the game of politics.

▲ ▲ ▲

U.S. and Business

In an editorial, "When Government Operates," the Charleston (S. C.) *News* predicts what might happen if the federal government exercised too much regulation over or controlled public utilities. While it may be a little over-drawn, the editorial clearly brings out an apparent inefficiency in the federal government's system in carrying on one of its business enterprises—the postoffice department. The editorial says:

"Gas flowed through pipes in houses and offices Thursday (Washington's Birthday). Electric current was available for light and power. The telephone company suspended no service. The telegraph companies were transmitting messages. Street cars and buses were running on their schedules. Private enterprise operates these public utilities.

"The postoffice system is a public utility. It is engaged in a necessary service. It is operated by the government. It celebrated Washington's birthday by taking the day off. The News and Courier received yesterday the mail matter which included news items —news items are perishable.

"The postoffice methods are reminders of government in business. Would the telegraph, the telephone, the power plants, the gas plants and other utilities be operated by government as efficiently as they are by private enterprises? When government operates the public seems to be without redress.

"The cost of using the United States mails has increased, but the service rendered to the public has been curtailed. It would not be so if private enterprise were handling the mails. Private enterprises would be careful to keep down complaints. Private enterprise can be reached.

"Can the postoffice department fairly claim to serve the public when it shuts down at every opportunity? What would happen to the telephone company if it did the same thing in principle? To the power company? To the gas company?"

With all its vast organization and noted efficiency the postoffice department, as well as other governmental organizations and agencies, many times overlooks little things which are vital to its biggest customer—business.

Recently, on the day before press time, TELEPHONE ENGINEER sent to its printer four type plates and it was imperative that they arrived at their destination the following day.

The next day came and the second day came and no plates were delivered to our printer. The third day rolled around and notification came that the plates were being held at the originating postoffice for ½-cent postage.

And mind you — TELEPHONE ENGINEER and its printer have been using the mails for a quarter of a century and still the government operated postoffice would not forward the cuts to the point of destination and take a chance of collecting a lousy ½ cent in postage.

What was the result—two business establishments—two good customers of the postoffice department—lost money, time and a lot of goodwill because the government would not trust either one for ½ of a cent.

We join the Charleston *News* in asking, "What would happen to the telephone company if it did the same thing in principle? To the power company? To the gas company?

INDEPENDENT NRA CODE REVISED

A FURTHER revision of the NRA code for the Independent telephone industry has been made. In the following letter to members companies, President F. B. MacKinnon of the United States Independent Telephone Association reports the details of the hearings on the code submitted on March 23 and lists the changes that have been made in that code:

"TO ALL MEMBER COMPANIES:

"On April 23 to 25 inclusive, the public hearings were held in Washington by the NRA on the Telephone Code which had been submitted on March 23 by the Association in behalf of the Independent group and the American Telephone and Telegraph Company in behalf of the Bell group. At the hearing on April 23 these two codes were explained to the NRA officials and interested employees by C. P. Cooper, Vice-President of the American Telephone and Telegraph Company and by F. B. MacKinnon, President of the United States Independent Telephone Association. In addition to the statement by Mr. MacKinnon, other statements were made by Mr. John H. Agee of the Lincoln Telephone and Telegraph Company, emphasizing the inability of the Independent companies to pay higher wages or shorten hours of their employees; and by Mr. J. C. Crowley, Secretary of the Minnesota Telephone Association, explaining the condition under which the smaller companies are operating and asking that all Class 6 companies be exempt from the Code. These statements by representatives of the companies were followed by statements by employees' organizations and representatives of labor unions.

"Enclosed is a copy of the revision of our Code for the Independent group as filed with the NRA on April 26 at the conclusion of these hearings. At these hearings we filed amendments to our Code that had been passed upon by the Code Committee and after the hearings made further amendments as the result of the hearings. The revision we enclose, which we shall refer to as the revision of April 26, includes all of these amendments.

"The principal changes from the revision of March 23, a copy of which was sent you, are:

"(1) We have provided that exchanges in towns of less than 2,500 population which are not in the immediate trade area of a city of large population shall be exempt from the hour and wage provisions. These changes you will find in Section 6 of Article III and Section 2 of Article IV.

"(2) We have inserted Sections 3 and 4 in Article III, which provide for a longer work-week at resorts than the normal work-week otherwise provided and provide for the payment of time and one-half or compensatory time-off where employees are worked for more than 40 hours in Classes 1, 2, 3 and 4 and 48 hours in Classes 5 and 6.

"(3) We changed the provision in Section 1 or Article V so as to eliminate the employment of persons under 16 and of persons under 18 in outside work.

"(4) Provisions in regard to the Code Authority were rewritten to meet the standards required by the NRA in all Codes.

"(5) The effective date is to be the second Monday after the approval of the Code by the President.

"(6) We have added to Article XIII a procedure by which the members of the Association may vote to cancel the Code after the expiration of 90 days.

"In addition to calling your attention to these particular items, we suggest that you read the whole Code over very carefuly so as to become familiar with some of the smaller changes which were made. When you have done this, we will appreciate your writing us your opinion of the changes and your suggestions for further changes. Under the procedure which we have been following, the Executive Committee of the Association, acting as a Code Committee, has considered it their responsibility to formulate and present the Code to the NRA; keeping all members closely advised as to the various changes made in the Code from time to time and the procedure being followed. When, after further conference, the Code is drafted in final form, it is proposed to submit this final Code to the membership for approval, and in such a way that all members will vote on the acceptance of the Code. We are, therefore, very anxious to have criticism of the Code at this time and suggestions for other changes that the members think should be made to make it acceptable to them."

In order that telephone operating men may compare the principle changes in the revised code of March 23 (published in the April issue of TELEPHONE ENGINEER) with the revised code of April 26 we are presenting below the revised sections in full:

ARTICLE III—HOURS OF EMPLOYMENT

Section 3—The maximum hours fixed in Paragraphs 1 and 2, above, may be increased in resort places to care for peak business during a period not to exceed six (6) weeks in a calendar year but in no case shall the hours of any employee be increased by more than eight (8) hours per week during such period.

Section 4—If work is required for more than the maximum hours provided in Sections 1, 2 and 3 above, either overtime shall be paid at the rate of time and one-half, or compensatory time-off shall be allowed within a 90 day period.

Section 6—The maximum hours fixed in paragraphs above shall not apply to small exchanges in towns of less than 2,500 population, which are not in the immediate trade area of a city of larger population, nor to small exchanges where the services does not require more two operators on duty at any one time, which exchanges are not in the immediate trade area of a larger exchange; nor to employees on emergency maintenance and repair work, nor to employees in a managerial or executive capacity who now receive more than $35.00 per week, nor to line patrol and repair men in isolated places, nor to watchmen, nor to very special cases where restrictions of hours because of emergencies would result in interruption of impairment to service to the public. Employees engaged in night work may be subject to call at any time for a night time period of 12 hours, but shall not be required to perform actual work in excess of the maximum hours of work provided for in the above paragraphs.

ARTICLE IV—MINIMUM WAGES

Section 2—In exchanges in Class 5, the companies shall pay employees not less than 20% in excess of the wages paid such employees in said exchanges on July 1, 1933, and in exchanges of Class 6, the companies shall pay employees not less than 10% in excess of the wages paid such employees in said exchanges on July 1, 1933, provided that, in either case, this shall not require wages in excess of $12.00 per week; and provided that the provisions of this Section shall not apply to exchanges in towns of less than 2,500 population, which towns are not in the immediate trade area of a larger city.

ARTICLE V—GENERAL LABOR PROVISIONS

Section 1—No telephone company, party hereto, shall employ any person under 16 years of age, and except in work in offices and central offices no such company shall employ any person under 18 years of age.

ARTICLE VI—ORGANIZATION, POWERS AND DUTIES OF THE CODE AUTHORITY

Section 1—A Code Authority is hereby established consisting of seven persons to be elected in the following manner:

(a) Four members to be elected by the members of the Industry that are members of the United States Independent Telephone Association.

(b) Three members to be elected by members of the Industry that are not members of the United States Independent Telephone Association; but if not elected within thirty (30) days from the effective date of this code, they may be appointed by the Administrator.

Section 2—The Administrator may name not more than three representatives who, without expense to the industry, shall have the right to attend all meetings of said Code Authority, but such representatives shall have no vote at said meetings.

Section 3—Each trade or industrial association directly or indirectly participating in the selection or activities of the Code Authority shall (1) impose no inequitable restrictions on membership, and (2) submit to the Administrator true copies of its articles of association, by-laws, regulations, and any amendments when made thereto, together with such other information as to membership, organization, and activities as the Administrator may deem necessary to effectuate the purposes of the Act.

Section 4—In order that the Code Authority shall at all times be truly representative of the industry and in other respects comply with the provisions of the Act, the Administrator may prescribe such hearings as he may deem proper; and thereafter if he shall find that the Code Authority is not truly representative or does not in other respects comply with the provisions of the Act, may require an appropriate modification of the Code Authority.

Section 5—Nothing contained in this code shall constitute the members of the Code Authority partners for any purpose. Nor shall any member of the Code Authority be liable in any manner to anyone for any act of any other member, officer, agent or employee of the Code Authority. Nor shall any member of the Code Authority, exercising reasonable diligence in the conduct of his duties hereunder, be liable to anyone for any action or omission to act under this code, except for his own wilful malfeasance or non-feasance.

Section 6—If the Administrator shall at any time determine that any action of a Code Authority or any agency thereof may be unfair or unjust or contrary to the public interest, the Administrator may require that such action be suspended to afford an oppportunity for investigation of the merits of such action and further consideration of such Code Authority or agency pending final action which shall not be effective unless the Administrator approves or unless he shall fail to disapprove after thirty (30) days' notice to him of intention to proceed with such action in its original or modified form.

WORTH WHILE INVESTMENT

For some years we have been studying with considerable interest your articles on practical telephone engineering practice. Many helpful ideas have been gleaned from your publication which have enabled us to plan and institute certain changes whereby we are on the road toward modern standardization in our equipment. . . . .

I might again say that we have followed with special interest the various articles in TELEPHONE ENGINEER and consider our subscription a well-worth-while investment.

W. B. WOODS, Jr., Plant Mgr.
Navajo Apache Telephone System, Inc.

Section 7—Subject to such rules and regulations as may be issued by the Administrator, the Code Authority shall have the following powers and duties, in addition to those authorized by other provisions of this code.

(a) To obtain from members of the industry such information and reports as are required for the administration of the code. In addition to information required to be submitted to the Code Authority, members of the industry subject to this code shall furnish such statistical information as the Administrator may deem necessary for the purposes recited in Section 3 (a) of the Act to such Federal and State agencies as he may designate; provided that nothing in this code shall relieve any member of the industry of any existing obligations to furnish reports to any Government agency. No individual report shall be disclosed to any other member of the industry or any other party except to such other Governmental agencies as may be directed by the Administrator.

(b) To use such trade associations and other agencies as it deems proper for the carrying out of any of its activities provided for herein, provided that nothing herein shall relieve the Code Authority of its duties or responsibilities under this code and that such trade associations and agencies shall at all times be subject to and comply with the provisions hereof.

(c) (1) It being found necessary to support the Administration of this code, in order to effectuate the policy of the Act the Code Authority is authorized:

(a) To incur such reasonable obligations as are necessary and proper for the foregoing purpose and to meet such obligations out of funds which shall be held in trust for the purposes of the Code and raised as hereinafter provided.

(b) To submit to the Administrator for his approval, subject to such notice and opportunity to be heard as he may deem necessary:
1. An itemized budget of its estimated expenses for the foregoing purpose, and
2. An equitable basis upon which the funds necessary to support such budget shall be contributed by all members of the Industry;

(c) After such budget and basis of contribution have been approved by the Administrator, to determine and collect equitable contributions as above set forth, and to that end, if necessary, to institute legal proceedings therefor in its own name.

(d) Each member of the industry shall be liable for his or its equitable contribution to the expenses of the maintenance of the Code Authority as herein provided. Only members of the industry complying with the code and making such contribution shall be entitled to participate in the selection of the members of the Code Authority or to receive the benefits of its voluntary activities or to make use of any NRA insignia.

Section 8—The Code Authority shall cooperate with the Administrator in regulating the use of any NRA insignia solely by those members of the industry who have assented to and are complying with, this code.

Section 9—The Code Authority may divide the country into geographical divisions for the purpose of administering this code.

Section 10—The Code Authority may appoint a regional committee for each such geographical division and may delegate to such committees such of its powers and duties as it shall deem necessary for the proper administration of this code under the sanction and with the approval of the Code Authority.

ARTICLE XII—EFFECTIVE DATE

This code shall become effective on the second Monday after its approval by the President.

ARTICLE XIII—TERMINATION

This code shall continue in effect for a period of ninety days after the effective date thereof, subject, however, to amendment as hereinabove provided, and subject also to the reserved power of the President to cancel or modify his approval thereof. The code shall continue in effect after the expiration of said period in ninety days in the absence of the exercise of such reserved power by the President, or in the absence of the exercise by the members of the Association of the power which they hereby reserve, to terminate this code at any time after the expiration of said period of ninety days. If a proposal to cancel shall have been submitted to the members of the Association subject to the code and at least two-thirds of the votes entitled to be cast shall be in favor of cancellation, the Association shall have the power, after service of a thirty-day notice on the Administration, to terminate said code. When so terminated, all subsequent liabilities and obligations hereunder shall cease. Notwithstanding such action by the Association, any subdivision of the industry may elect to continue the code in effect as to itself.

THE LINE PROBLEM OF TOLL CENTER DISTRICT

By

F. J. DOMMERGUE

IN THE multitude of toll center districts the toll center itself is in the jority of cases a medium sized town and the tributary exchanges are small towns and villages. Thus we find in these toll center districts as a rule only single-office exchanges. The same holds true for the tributary exchanges in toll center districts surrounding primary outlets and regional centers, but the toll centers of such districts are nearly always multi-office exchanges. However, for the discussion of our problem we intend to restrict ourselves to the districts with single exchange toll centers.

The assumption is that in all exchanges of such districts including the toll center itself comparatively little underground construction is in use at present, and that the distribution is practically all performed by aerial cable. As the office is mostly located at or near the business center of the community, the underground part of the wire plant consists of the cable entrance into the office and in many cases of cables laid in streets taken up by stores and other commercial buildings; outside of those streets the cables are carried on pole lines. It will be noticed by inspecting these pole lines that a considerable part of them consists of high poles used in common by the telephone company and the electric light or power company. Such joint pole lines are of particular economical value and should be employed wherever possible.

In towns cedar poles are given preference. They have their butts treated with some kind of tar product and in addition they are often painted above ground. Outside of communities the use of creosoted pine poles is very economical. The principal objections to the use of creosoted poles in communities is their strong tar odor, the softening of the oil by the sun in warm weather, and the consequent difficulty in climbing the poles.

Outside of the impregnation by creosote there are several methods or processes which employ salts as preservative; these methods differ mostly in the salts of heavy metals used to prevent the residual substances in the poles from fermenting, the combination of the salts with the substances becoming very indifferent against water, the salts themselves not attacking the wood fiber in the least.

The salts used as wood preservative are principally zinc meta-arsenite, sulphate of copper, zinc-chloride and bichloride of mercury. The preservative treatment of wood by zinc meta-arsenite is fully described in the Illinois Telephone Handbook's tenth edition, where also data pertaining to the creosote treatment of yellow pine are given. To our knowledge no use has been made in this country of the other salts mentioned, but in Europe they have found application in the days when the poles were impregnated at the forests where the poles were cut. As the treatment employs only simple means it may be instructive to describe it briefly.

The place to be selected for the treatment is to be in or near the forest where the poles are cut and where pure water is available free of chalk or iron, for the preparation of the salt solution. The poles are delivered at the place of impregnation with the bark still on, the branches trimmed close to the trunk, and the ends cut off at right angles to the axis of the pole. The poles are brought to the place directly after they are cut; if they can not be treated within ten days after being cut, they are kept under water.

The treatment begins by resting the butt ends of the poles upon a bench, while the tops rest on the ground. The solution is injected either by hydrostatic or steam pressure. In the "Boucherizing Method," as the treatment by sulphate of copper is called, the solution consists of 1½ parts sulphate of copper to 100 parts of water by weight, and is prepared in a tank located on the ground or partly sunk into the ground. When hydrostatic-pressure is used, a scaffold is erected with several platforms, according to the sizes of poles that are to be treated, as shown in Fig. 1. Upon each platform a tank is provided into which the solution from the mixing tank is pumped. From the pressure tank a pipe leads vertically down to the level of the butts of the poles and there turns horizontally and passes along, or rather in between the butts of the poles arranged on both sides of this pipe on the bench, this bench being only a few feet above the ground so as to give the solution sufficient pressure due to its fall to penetrate the whole length of the poles.

Fig. 2 shows this bench and also the horizontal part of the feeding pipe provided in front of each pole with a nozzle to which a rubber hose can be attached, the other end of the hose to fit a wooden plug K, Fig. 3, driven into a hole P in a square piece of two-inch plank ST; this plank is held to the butt of the pole by two hooks b and b', the two points c and c' being driven into the pole and the two other ends being provided with a screw-thread and nuts so that the plank may be pressed against the butt as much as needed.

Between the plank and the butt a chamber is formed by laying hemp rope i and i' around the edge of the butt, which serves as a receptacle for the solution as indicated on the figure; this figure shows also a trough under the butts intended to catch any drips and to return them to the mixing tank. Of course all pipes must be of lead or copper to withstand the chemical action of the solution.

Where steam pressure is used, the solution is transferred from the mixing tank into a second tank from which it is pressed into the chambers at the butt ends of the poles by a steam pump under a pressure of 15 to 20 pounds. In less than an hour's time after application of

Fig. 1.—Scaffold

the solution the sap begins to appear. As soon as pure impregnating solution flows out of the pole, the process is finished and the poles are removed. With steam pressure the duration of the process is from two to five days.

In the "Burnettizing Process," as the method employing diluted zinc chloride is termed, the poles are put into an hermetically sealed chamber and are heated for two hours under high pressure steam to 100° Centigrade. After the expiration of the steaming the condensing water is drawn off and a vacuum is set up in the tank of 523 mm. mercury, which is obtained in about half an hour and which must be maintained for another half hour. After that the zinc chloride solution is forced in and held for an hour under a pressure of from 6 to 8 atmospheres.

The solution in the "Kyanizing Process" consists of 1 part of bichloride of mercury dissolved in 150 parts of hot water. The solution is mixed in a mixing tank and pumped into an open tank into which the poles are laid; this tank is covered to keep the light out. After a period of 8 to 13 days the solution is returned to the mixing tank. In this process as well as in the Burnettizing process it is essential that the poles are well seasoned before being placed in the tank.

In late years tape-armored toll and long distance cable has been laid in some installations directly into the ground. This method of line construction deserves a brief accounting. It was in Europe where first paper cables were buried into the ground; this method was used, however, in comparatively small and unimportant installations. The cables were laid in a ditch upon a bed of sand one inch thick to keep them dry. Upon the sand was stretched a sheet of tarred felt paper sufficiently wide to permit of wrapping around the cable. Upon the paper a hot asphalt compound was poured, and where danger of disturbance or damaging was anticipated an impregnated plank served as a cover before the backfilling was started. Still this process proved insufficient to protect the cable from corrosion. To overcome this evil zinc plates were attached to the cable and in some cases the cable was galvanized, but none of these precautions gave lasting satisfaction. Finally they came to armoring the cable by winding it spirally with galvanized steel tape and besides protecting it against chemical action by jute.

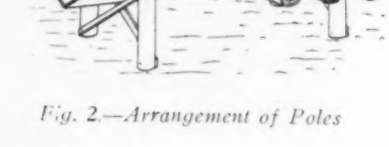


Fig. 2.—Arrangement of Poles

Convention Schedule

California Independent Telephone Association, Hotel Lafayette, Long Beach, May 22.

Up-State Telephone Association of N. Y., Syracuse, May 23-24.

United States Independent Telephone Association, Stevens Hotel, Chicago, July 10-13.

In this country also attempts have been made at burying cables directly into the ground but only in small installations; for larger installations the tape-armored cable was first inaugurated by the Southwestern Bell Telephone Co., other installations followed.

C. W. Nystrom of the Southwestern Bell Telephone Co., described this tape-armored toll cable in a paper presented at the South West District meeting of the A. I. E. E. at Kansas City, Mo., October 1931, as being a toll cable having its lead-sheath first covered with a wrapping of paper, followed by two layers of jute roving. Next two steel tapes are wound around the cable, one over the other, each tape being two inches wide and 41 mils thick. The adjacent turns of the tape are kept one-half inch apart and the outer layer is placed so as to cover the space left between the windings of the inner layer. Then follow two wrappings of jute, and finally the whole is coated with an asphalt compound. The finished cable is whitewashed to prevent sticking when reeled.

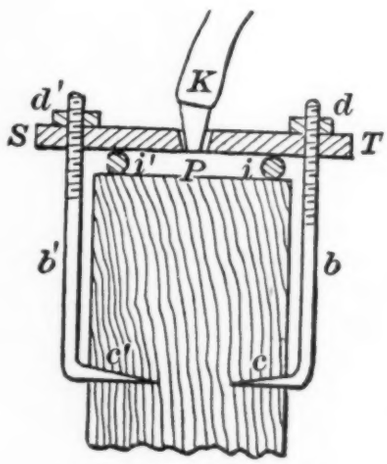


Fig. 3.—Fluid Chamber

In laying, the cable is threaded through a pipe which leads it to the trench, which has been excavated by a plow, called a "rooter," attached to a chassis which carries the reel, the outfit being pulled by a tractor, which also pulls a backfiller, so that the trenching, cable laying and backfilling is performed in one operation. It is possible to lay one mile of cable per day with this equipment under ordinary conditions.

This brief explanation may suffice, but one thing more may be mentioned. Mr. Nystrom in his paper made the statement that the cost of tape-armored cable compared to the cost of pole line cable is as 10 to 9 for one cable and as 10 to 8.5 for two cables. He anticipates improvements whereby the laying of tape-armored cable will be lower in cost than the placing of aerial cable on pole lines.

Of course no exact comparison can be made as the local conditions such as topography of the territory in which the cable is to be laid, the kind of soil, etc., weigh heavily. However, this method of laying toll cables is of such importance that it should be taken into consideration whenever the wire plant for a toll center district is studied.

ENTERTAINS EMPLOYEE SALESMEN

Fred W. Bechdolt, manager of the Northwestern Telephone company, Defiance, Ohio, was host to employes at a dinner given in appreciation of the success and splendid efforts put forth in the new business campaign having 100 per cent employes anticipating, selling the largest number of telephones, competing with all the exchanges in the subsidiary group.

After dinner Mr. Bechdolt introduced and called upon the following who responded with short talks: George B. Quatman, Lima, general manager; Charles W. Wilson, Shelby, division manager; A. G. Vandemark, Lima, assistant treasurer; J. A. Strohm, Defiance, wire chief; Mrs. Bertha Raynor, Defiance, chief operator.

LAST MINUTE NEWS

FLASH—As this issue of Telephone Engineer goes to press it is announced that by a vote of 201 to 19, the house of representatives joined the senate in approval of the Johnson Bill, wresting jurisdiction over utility rate cases from all federal courts except the Supreme Court of the United States.

Amended in only one particular, the bill slipped easily through the house after a determined effort to substitute a less drastic bill had been overwhelmingly rejected.

DATA FOR RATING TELEPHONE CIRCUITS

This is the Concluding Installment on "Data For Rating Telephone Circuits" by Messrs. McKown and Emling. Starting with the June Issue a Series of Articles on "Transmission Standards" will be Published. Following This Series Another on "Allocation of Losses" will be Presented.

By
F. W. McKOWN
and
J. W. EMLING

From the July issue of the Bell System Technical Journal

(Continued from April)

DATA for preparing effective loss ratings have been obtained primarily from repetition counts made during a series of special transmission observations on calls between telephone employees in the regular course of their business. These calls were made over special facilities which permitted the variation of the circuit constants over a wide range and the rating of the various conditions relative to each other in terms of repetitions. During these tests, different types of instruments were used and changes were made in the sidetone characteristics of the sets, and the attenuation and type of trunk. Each type of change covered rather completely the whole range found in the present telephone plant and to some extent that expected in the future plant, but it has been practicable to cover only a small portion of the combinations of instruments and circuits which might be used together in commercial service.

In the preparation of the necessarily large quantities of effective transmission data from the transmission observations, the principal problem is to determine the rating of any complete circuit from the limited number of complete circuits which have been rated directly. The determination of these additional ratings is relatively easy if the circuits can be described in terms of a few simple characteristics which will serve as a basis for interpolating between the ratings obtained directly from observations. The physical measurements which can readily be made in the required quantity describe a circuit in a complex manner, namely, in terms of the efficiency, at each frequency in the voice range, of the several speech and noise transmission paths of the complete circuit. These data must, therefore, be combined in some way to give a relatively small number of parameters for describing the circuit.

The definitions of these parameters may be more or less arbitrary, provided that the circuit performance is the same for circuits having numerically equal parameters regardless of differences in physical characteristics. The number of parameters required to describe a circuit is largely a matter of convenience. A small number tends to make the interpolation simple, but the derivation from the measurements complex. The converse holds for a large number. For preparing effective transmission data for the local plant, the circuit description has been expressed in terms of five parameters as follows: The volume loss from the transmitter of one set to the receiver of the other, the sidetone volume loss at the talking end, the sidetone volume loss at the listening end, the circuit noise efficiency of the station at the listening end, and the distortion. An important advantage of using these particular parameters is that each represents a circuit characteristic generally recognized as affecting transmission performance. The electrical line noise at the station end of each subscriber loop and the average room noise at the station are, of course, two other parameters which are maintained at the reference value except when computing line noise and room noise losses.

The computation of effective ratings from repetition observations and circuit measurements may be summarized as follows: The transmission observations are preferably made on various series of circuits, in each of which one parameter is varied while the others are kept constant. First, a series of observations is made on circuits which are identical except that the volume loss is varied by distortionless changes in the trunk attenuation; preferably these should be various adjustments of the working system. A second series of observations is made with a constant volume loss but with variations in some one of the other parameters; for example, the sidetone at one end of the circuit might be varied. From this series of tests in conjunction with the first series, the distortionless change in volume loss, which is equivalent to each change in sidetone, is determined both for transmitting and receiving and curves of effective loss versus sidetone may be established. The change in effective transmitting efficiency is due to the fact that telephone users raise their talking volume when the sidetone is reduced. The change in effective receiving efficiency is due to the fact that a reduction in sidetone reduces the interfering effect of room noise.

In the same way, distortion and noise are varied separately and the effect of each of these changes in terms of equivalent change in volume loss is determined.

Room noise losses are difficult to determine with any degree of accuracy by observing on working circuits since it is impractical to introduce artificial room noise, and natural variations in room noise are, in general, accompanied by other variations affecting repetitions. Laboratory or theoretical methods of determining these losses are not satisfactory since, as room noise changes, the subscriber consciously or unconsciously tries to counteract the effect and such reactions cannot be studied satisfactorily under controlled laboratory conditions. Each method, however, helps to determine the general magnitude of these effects.

In practice it is seldom possible to vary one parameter over a wide range without causing some variation in the other parameters, but this does not add any serious complication to the derivation of the relations. It is merely necessary to make successive, approximate corrections when deriving each relation.

After these relations have been established, it is possible to predict the performance of any ordinary circuit by computing the five parameters from the physical measurements. The magnitude of each parameter may then be compared

(*Please turn to page 23*)

IDEAL TELEPHONE SYSTEM SERVES HAWAII

P. Kerr Higgins, Veteran and Popular Telephone Authority, Describes the Formation and the Operation of the Efficient Telephone System That Serves the Hawaiian Islands. Mr. Higgins Recently Returned From an Extended Trip in the Islands and Gives Us a First Hand Story of This Territory and Its Communication Facilities.

By

P. KERR HIGGINS

THE Hawaiian Islands were discovered by Captain Cook in 1778 and named the Sandwich Islands. The first printing press was used in 1822. The first newspaper, *The Sandwich Islands Gazette*, was published in 1835. Independence was recognized in 1842, ceded to Great Britain 1843, Republic established 1894, annexed to United States 1898. Pearl Harbor Dry Dock opened 1919. First airplane flight to Hawaii from the mainland was in 1927.

Population of the islands is as follows: Honolulu 142,460, (Oahu) County 65,233, Hilo 15,459, County Hawaii 60,704, Other Counties 96,355.

They are a group composed of eight islands, of which Hawaii (Pathway of the Gods) is the largest and on which the city of Hilo and the Crater of Kilauea and Moana are located. Honolulu is situated on the Island of Oahu (Gathering Place).

It is claimed that every tree on the islands blooms. There are no snakes or reptiles. There are three thousand varieties of Hibiscus. The language contains only the letters A, E, I, K, L, M, N, O, P, U, W, H and sometimes Y.

The population is diversified, consisting of Hawaiian, 22,024, Cacasian, 17,643, Asiatic, 15,300, Portugese, 28,950, Puerto Rican, 7,184, Spanish, 1,200, Other Cacasians, 46,500, Chinese, 26,900, Japanese, 146,980, Korean, 6,650, Philipino, 60,360. The above includes the Army and Navy.

The forest area is about 900,000 acres. Government reserve is 245 square miles and contains two craters, Kilauea and Moana Loa. The former is active once a year, the latter every four years and is the largest active volcanic mass in the world. These craters are located about 222 miles from Honolulu and are both on the Island of Hawaii.

Pineapples and sugar cane are the principal products. The former cover about 100,000 acres and the canneries about fifty acres. The capacity of the largest cannery alone (Doles) is 130,000 cases per day or 2,788,412 cans. Automatic machines are used with a speed of 85 pineapples per minute. The time consumed in canning a pineapple (from the time it enters the cannery until it is canned, vacuum sealed and labeled) is 15 minutes. The production of citric acid is over 750,000 pounds yearly. Pineapple bran, 103,015 bags of 100 pounds each, is produced yearly.

Most telephone men in thinking of Hawaii seem to have the view that telephone development on these far-away islands is slow and non-progressive. Imagine my surprise to find one of the most up-to-date and complete telephone and wireless systems in the world.

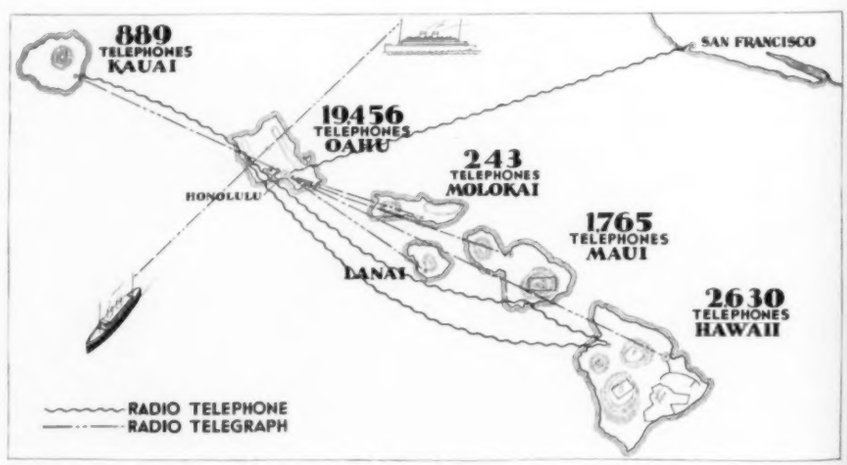
Honolulu, the capitol city of the islands, was one of the first to put the telephone into practical use. In 1880, it had more telephones than any city of its size. The telephone was introduced to the islands by Senator C. H. Dickey early in 1878 and put into service. In the same year, S. G. Wilder, then Minister to the Interior, installed telephones between his lumber yard and the government buildings.

The first telephone company, The Hawaiian Bell Telephone company, was organized and incorporated in 1879, and started service on December 30, 1880, with 30 subscribers. The original investment was $6,000, now $6,000,000, and most of it was raised locally. It proved to be a profitable undertaking, netting 600 per cent. It looked so good that a rival company was started under the name of The Mutual Telephone company. In March 1885, it began operation in competition with the Bell company, which at this time had 100 stations.

The competition continued for about 10 years. The Mutual company won the fight and secured control of the Bell company, which then had 565 to 701 Mutual stations. The consolidated company had 900 stations after taking out duplicates.

The old "Law System" was the first installed, and it was used by both companies. Many other types were used later due to fires and obsolescence. In 1899, the "Sabin Express Board" was installed and kept in use until 1906, when the Western Electric C. B. full multiple lamp signal switchboard was installed. This lasted only three years due to the wonderful growth of the system. At this time, The Hawaiian Telephone & Telegraph company, operating the wireless telegraph system between the islands, was consolidated with the Mutual Telephone company. And so it stands today.

The Strowger Automatic system



Mutual Telephone Company's System.

started operation August 28, 1910. At that time there were 1,800 stations, all direct, metallic circuit lines. The population of Honolulu is cosmopolitan and took very kindly to the new system and it is still giving perfect satisfaction. Many languages are spoken on the islands and so it fitted their needs to perfection. Only one office was used until 1916 when another office was located to serve the suburb of Kaimuki. A year later a third was installed in the opposite direction and in 1928 another, named Punahou exchange.

These four exchanges, with twelve unattended exchanges, now serve Honolulu. This system now serves nearly 20,000 station, of which over 16,000 are in the City of Honolulu. The system is a Strowger two-wire automatic step by step operated at 48 volts. The four principal exchanges in Honolulu are about two miles apart, the main building being located at 1128 Alakea Street.

Honolulu is an expensive city in which to build from a telephone standpoint, as from end to end it is approximately 15 miles long. The plant is 90 per cent cable and more than 60 per cent is underground. The latter extends for more than seven miles to Fort Shafter and also to Waikiki and Kapiolani Park. There are no party lines in the city and no metered service. The rate for business is $8.75 and for residence $4.00. Considering the rates, the development is most remarkable.

The unattended units are housed in very attractive concrete buildings, well planned and arranged to conserve space and reduce moisture, which is a very serious problem in Honolulu. The unit consists of two 100-line rotary switches, which serves 200 lines and is connected to the nearest main exchange by 40 trunk lines.

The plans made it possible to effect an enormous saving in cable plant; hence the reasonable rates charged. Each unit

Main Building, Mutual Telephone Company, Honolulu, Hawaii.

J. A. Balch

has a 48-volt storage battery, charged constantly by rectifiers. Signals for trouble and testing are connected to the main exchange; hence, these units require very little attention and very few visits.

The cable plant consists of cables varying from one residence, etc., to 800 pairs, No. 22 B & S gauge. The trunk lines are No. 19 B & S 0.09 cables. The conduit system is made up of three and one-half inch socket joint fibre conduit. Some of this has been in service 20 years. Conduit is buried on an average of three feet below the surface of the ground and laid in concrete. Manholes

F. G. Hummel

are mostly under the sidewalks and are approximately 4'x4'x6' in size. The underground system is patrolled daily to anticipate and prevent damage by excavations. This patrol also keeps the manholes free from mud deposit and decayed vegetation, as these have been found very injurious to the lead sheath of the cables. This injury is due to sulphides and acts similar to electrolysis. All cables are bonded in every manhole and the system to the street railway tracks and also to the negative pole of the generator.

The aerial cable consists of 100, 50 and 20 pair No. 22 gauge B & S copper. Most of the poles are jointly owned with the Street Railway company.

One of the greatest drawbacks (if it might be called that) is the humidity which is ever present and often rises to 90 degrees; also the salty air. However, the management through some very clever devices and arrangement of apparatus has this trouble well in hand. Single No. 17 copper clad or bronze wire is used exclusively instead of duplex for drop wires (due to the humidity and the use of 48 volts potential) also specially made interior duplex is necessary. Iron wire and messenger and guy strand have very short life due to the salt air; hence the use of copper wire, copper clad and bronze wire is general; also concrete anchors, with bronze guy wires. Rubber insulated cords are used for substations and moisture proof cords for central office. All substations are wired with a simple series circuit, no induction coils being used.

To regulate the humidity, electric heaters are used which are switched on by automatic hygrometers when the humidity rises above 65 degrees.

There are about 100 private branch exchanges in use, the largest, 450 stations, being in the Royal Hawaiian Ho-

(*Please turn to page* 30)

P. Kerr Higgins and F. G. Hummel, Vice-President of the Mutual Telephone Co.

LINE and DESK

Ray Blain, A. I. E. E., Editor

Q.—Can anything be gained by driving rods deeper than five feet in the average soil?

A.—The five-foot ground rod is generally considered adequate for general telephone work. However, a longer rod will give a lower resistance ground when one is considered necessary. As an example a five-foot rod driven into light sand measures 318 ohms, and a 10-foot rod driven into the same soil measures only 250 ohms, a reduction of 68 ohms by driving the rod five feet deeper.

Q.—Why are most manhole covers for telephone work round instead of square and is there any particular objection to the use of the square covers?

A.—The round manhole cover is generally smaller than the square one, built heavier, and consequently stronger. Round corners are recommended for use when located in streets where heavy traffic is likely to pass over them. The square cover is desirable for use inside curb lines or in lawns. The square cover is also desirable for use with small shallow manholes, or pull-boxes as the opening is larger and permits greater working space for the splicer.

Q.—What method is recommneded for polishing switchboard plugs and how often should they be cleaned on the average switchboard?

A.—Switchboard plugs should ordinarily be cleaned at least once per week using an approved plug polish. Power driven rag buffing wheels are often used on large switchboards for plug polishing. On small switchboards plugs may be effectively cleaned by using a rag or cotton tape with the plug polish to clean the plugs by hand.

Q.—What is considered the best method of measuring-off 140 ft. spans on a rural line when only a 100 ft. tape line is available?

A.—Perhaps the best method is to measure two lengths of 70 ft. each. Another way it may be done is to measure off the full length of the 100 ft. tape, then a 40 ft. section and locate a pole. Next measure off another 40 ft. section, then another 100 ft. section and locate a second pole. Of course a 200 ft. tape line would be more accurate and convenient than either of the above methods.

Q.—How often should linemen's belts and safety straps be treated with oil?

A.—Ordinarily they should be treated with a suitable oil about every six months. The leather should first be cleaned of all dirt by washing thoroughly with a good alkali free soap such as castile. While the leather is slightly damp, work a small quantity of neatsfoot oil into the leather until it is pliable. Do not use a quantity of oil that will cause the leather to look greasy. After the leather has dried rub it vigorously with a dry cloth to remove any surplus oil. Belts should never be washed in gasoline or oiled with mineral oil such as vaseline or machine oil as this will tend to weaken the leather. After oiling, belts should be stored in a cool place for about 24 hours before using, which will permit the oil to soak-in thoroughly and dry.

Q.—What is meant by a lamp associated multiple type switchboard?

A.—It is a switchboard on which each multiple jack has a line lamp associated with it. On these switchboards there is no separate answering jack and when a line calls all lamps associated with that line will light simultaneously. When an operator plugs into any jack on a line all lights are extinguished. This system automatically distributes the load between operators.

Q.—What is considered the lowest insulation resistance permissable on a subscribers line?

A.—Most telephone companies start planning some remedial action on lines which the insulation resistance is found to be 50,000 ohms or less in wet weather. This low insulation resistance is frequently caused by worn drop wires or trees touching lines.

Q.—Should lagging be fastened on empty cable reels before returning to the manufacturer?

A.—Most manufacturers prefer that lags be bound together in bundles of 10 and shipped separate from the reels. This makes handling of the reels easier and eliminates the work of fastening them back on the empty reel and in many cases damaging some of them. Laggings should be bundled, two high, set on edge and bound together with wire or lag banding.

Q.—What is considered the proper method of connecting a ground wire to steel messenger strand?

A.—A standard ground clamp, which can be purchased at a very small cost, should always be used for this purpose.

Q.—What is considered the maximum length for a span of drop wire and how much slack should be left in it at the time of installation?

A.—Most telephone men prefer that the length of a drop wire span be limited to 150 ft. though some of 200 ft. are used in certain localities. In areas where the ice load gets heavy on lines in winter the length of the drop wire span should be shortened and in no case should it be over 150 ft. in length. In a span of 150 ft. at least 3½ ft. of slack should be left in it at the time of installation.

Q.—What size bridle rings should be used on a run carrying three pairs of wires?

A.—When a run is not to carry more than four pairs of wires the ⅝ inch bridle ring is generally considered adequate. When more than four pair is to be run the 1¼ inch size is generally preferable.

Q.—Is the chain hoist recommended for use on telephone line construction and if so what is its general advantages?

A.—Many telephone companies are making use of the chain hoist, of the kind designed for line work, with absolute satisfaction. These hoists have the advantage over blocks and tackle in that they will hold the load at any point, can be raised or lowered without danger of slipping. It is believed that one or more chain hoists will prove a worthwhile investment for any telephone company.

Q.—When stringing parallel type drop wire, is the special deadend and intermediate clamps a necessity?

(*Please turn to page* 30)

DATA FOR RATING CIRCUITS

(*Continued from page* 15)

with the magnitude of the same parameter in the reference system, and the difference between the two magnitudes may be converted into equivalent distortionless changes in volume loss by means of the curves. These ratings may then be combined to give a single effective loss rating of the circuit. For the normal range of conditions existing in the telephone plant simple algebraic addition of the component ratings gives the combined rating with sufficient accuracy provided the individual ratings are obtained under typical conditions. Ratings can be obtained only for complete circuits, since some of these parameters, such as distortion, have no meaning except when applied to a complete circuit, and others, such as sidetone, depend on two or more circuit elements. However, by choosing for computation complete circuits in which the elements to be rated are substituted for the corresponding element of the reference circuit, it is possible to determine the effective losses of individual circuit elements in accordance with the definitions given previously.

The parameters used for describing circuits have been used previously in a qualitative sense and several have quantitative definitions based on listening tests. A problem is presented, however, by the necessity for computing them from physical measurements. Volume loss, for example, has been defined in terms of voice-ear comparisons with an adjustable reference condition. Such a definition is satisfactory for describing this parameter but the testing method is cumbersome for obtaining the large amount of data required for engineering purposes. If, however, a series of such volume loss measurements is made on a large number of circuit conditions for which the physical characteristics are varied systematically, an empirical formula can be derived for weighting and combining the efficiencies measured over the voice-frequency range. Using this formula, the volume loss of other conditions can be readily computed. Similar methods may be used for deriving empirical formulas for computing noise and sidetone volume losses from the basic physical characteristics.

The use of distortion in a quantitative sense requires the adoption of a scale for this parameter. The only requirement for such a scale is that any two circuits having the same amount of distortion, all other parameters being equal, will give the same repetition rate. The term distortion factor is applied to the particular scale used in this work and its definition is derived from laboratory articulation tests. These tests are made on a large number of circuits which have equal volume losses but which differ from each other in frequency characteristics. The empirical formula for computing the distortion factor from the basic circuit measurements is set up so that all of the circuits which gave the same articulation rate will have the same distortion factor. From service observations made on a number of different types of circuits it has been shown that, with all other parameters constant, circuits having the same distortion factor will give essentially the same repetition rate. Presumably, other scales for expressing distortion could be used, with other formulas, and possibly these can be derived directly from repetition observations if a great enough variety of circuits is covered. In any case, it appears that some such distortion factor is needed since distortion in any complete telephone connection is too complicated to be classified by any simple means, such as specifying a cutoff frequency.

It should be pointed out again that the computations and measurements described provide merely a means of interpolating between transmission observation results and have both the limitations and advantages of an interpolation method. They cannot be used to predict performance of any circuit radically different from those covered by repetition counts, but on the other hand, any inaccuracy in the formulas used in computing the parameters is of only secondary importance since they are used only for interpolating between observed points. For limited applications to simpler circuits more direct methods might be satisfactory. For more complicated circuits, such as present-day long toll circuits, other parameters are needed to describe such characteristics as delay distortion and echoes.

Conclusion

The effective transmission data can be applied in practically the same manner as the volume loss data which they replace. Consequently, the effects on transmission service of distortion, noise and sidetone, as well as of volume loss, can all be taken into account in the design of the plant in a simple, systematic way. Such comprehensive transmission ratings are required to utilize properly the various types of facilities now employed in the telephone plant, to direct future developments, such as further reductions in distortion, and to incorporate into the plant the new types of facilities resulting from these developments.

Watch for Article on "Transmission Standards" Next Month

A. T. & T. INCOME UP FIRST QUARTER

The earnings of the Bell System, including the Western Electric company, in the first quarter of 1934 were at the rate of $1.53 a share on the capital stock of the American Telephone and Telegraph company, Walter S. Gifford, president, announced in his quarterly report to the stockholders. This is at the annual rate of $6.12 a share and compares with $5.38 a share earned in 1933.

The net income of the company in the quarter was $33,032,108, equal to $1.77 a share on 18,662,275 shares, comparing with $32,383,187, or $1.74 a share, in the same part of 1933. There was a deficit of $8,958,010 after dividends of $41,990,119, comparing with one of $9,606,931 after dividends in the first quarter of 1933.

The earnings from dividends were $30,307,796, comparing with $31,184,996 in 1933, but where the associated companies of the Bell System as a whole did not earn these dividends by about $7,500,000 in the first quarter of last year, they failed to earn them in the quarter this year by only $700,000. The parent company's earnings do not reflect the current deficit of the Western Electric company, which is still operating at less than 20 per cent. of capacity.

"During the first quarter of the current year there was a net gain of 108,000 in the number of Bell System telephones," Mr. Gifford says in his statement. "This compares with a net gain of 32,000 telephones in the preceding quarter and with a net loss of 340,000 during the first quarter of 1933. Each month since August of last year has shown a net gain in telephones. The number of toll and long distance calls during the quarter was approximately 8 per cent, greater than in the same period last year but was about 14 per cent less than in the first quarter of 1932."

NATIONAL CONVENTION JULY 10-13

The annual meeting and convention of the United States Independent Telephone Association will be held at the Stevens Hotel, Chicago, July 10-13, 1934, it has been announced. The meetings will be held in the Tower Room of the Stevens Hotel, as they were last year. Probably the convention sessions will be held in the forenoons, leaving the afternoons free for attendance at the World's Fair or other business. The manufacturers and suppliers will have rooms for headquarters on the 25th floor of the hotel.

SUPREME COURT UPHOLDS CHICAGO RATE CUT

THE United States Supreme Court on April 30 brought to a close the 11 year old Chicago telephone rate case with an order commanding the Illinois Bell Telephone company to refund some 30 millions of dollars, including about 9 million dollars of interest, to Chicago subscribers.

The court's order, in effect upholding rate reductions ordered on Aug. 16, 1923, by the Illinois commerce commission, means a future saving of approximately $2,000,000 a year to the 400,000 telephone users affected, it is estimated.

Chief Justice Hughes' opinion dismissed with passing mention the numerous allegations made by counsel for the commerce commission and the city concerning the manner in which, they claimed, the A. T. & T. had levied numerous charges on its subsidiary—charges which the Illinois company passed on to its subscribers in increased cost of operation.

The opinion reviewed the lower court's finding of fair value for the telephone company's property used in intrastate business, and recalled how the company had sought to upset the court's estimate that a fair rate of depreciation was 16 per cent for the years 1923 to 1928 and 15 per cent for succeeding years. The company, seeking to make the fair value of its property as high as possible, contended that the respective percentages should be 9 and 8.

Thus, while the court found the increase in fair value of the company's property to be from $124,200,000 in 1923 to $166,500,000 in 1932, the company's book value for those years was $95,074,135 and $181,925,963.

The court, Chief Justice Hughes recalled, then went on to fix a fair rate of return, and decided that it should be 7½ per cent for each of the years 1923 to 1927, inclusive, 7 per cent for each of the years 1928, 1929, and 1930, 6½ per cent for 1931, and 5½ per cent for 1932.

"On the basis of these findings of fact," said the chief justice, "the lower court concluded that the rates in suit were confiscatory at all times from the date of the commission's order."

The net income from the company's intrastate business, according to its own books, was $5,347,533 in 1932 and $8,494,616 in 1931. With certain writeoffs disallowed by the lower court the amounts available for return for those years were $6,646,183 and $9,826,299. But on the basis of the low court's fair rate of return, they should have been $9,315,000 and $11,641,500, in order to avoid confiscation.

"On this showing," said Chief Justice Hughes, "the findings if accepted would compel the conclusion that when the commission's order was made in 1923, not only the new rates, but the existing rates as well, were grossly confiscatory; that appellee was receiving under the existing rates, according to its books, a net return of $5,437,533 when it was entitled to nearly $4,000,000 more to prevent its property from being confiscated. The table shows a similar situation in the succeeding years.

"But, instead of challenging the existing rates as constituting an invasion of constitutional right, appellee when summoned by the commission, in September, 1921, in the proceeding which led to the order now under review, asserted that the existing rates were just and reasonable. And when this suit was brought in September, 1928, to prevent the enforcement of the new rates, appellee did not seek to enjoin the existing rates."

The financial history of the telephone company "repels the suggestion that during all these years it was suffering from confiscatory rates," the opinion said. The company's capital stock rose from 9 millions in 1901 to 70 millions in 1932 and to 150 millions in 1930. Its funded debt continued at approximately 50 millions from 1923 to 1930; during that period it paid the interest on its debt and 8 per cent dividends on its stock.

Its "fixed capital reserves" rose from $37,575,004 in 1923, to $63,966,748 in 1930, and $69,242,667 in 1931. The number of telephones in Chicago increased from 690,000 at the end of 1923 to 987,000 at the peak in 1929, then went to 940,000 by the end of 1931.

"The property has been efficiently and economically operated and the company has enjoyed excellent credit," the court's opinion said, then went on:

"This actual experience of the company is more than tabulations of estimates. In the face of that experience we are unable to conclude that the company has been operating under confiscatory intrastate rates.

"The glaring incongruity between the effect of the findings below (of the lower court) as to the amount of return that must be available in order to avoid confiscation and the actual results of the company's business makes it impossible to accept those findings as a basis of decision."

All this, said the chief justice, had the effect of narrowing the field into which the court must inquire. The question to be decided was simply whether "the company has established, with the clarity and definiteness befitting the cause, that this reduction would bring about confiscation." That reduction would have reached a peak of $1,740,000 in 1929 and a low poina of $1,270,000 in 1932.

Here, said the opinion, came the question of operating expenses.

"Charges to operating expenses may be as important as valuation of property," the court said. "Thus excessive charges of $1,500,000 to operating expenses would be the equivalent of 6 per cent on $25,000,000 in a rate base."

"According to the practice of the company," the opinion said, "the depreciation reserve is not held as a separate fund but is invested in plant and equipment. If the amounts charged to operating expenses and credited to the account for depreciation reserve are excessive, to that extent subscribers for the telephone service are required to provide, in effect, capital contributions, not, to make good losses incurred by the utility in the service rendered and thus to keep its investment unimpaired, but to secure additional plant and equipment upon which the utility expects a return.

"Confiscation being the issue, the company has the burden of making a convincing showing that the amounts it has charged to operating expenses for depreciation have not been excessive.

"In this instance, the evidence of expert computations of the amounts required for annual allowances does not stand alone. In striking contrast is the proof of the actual condition of the plant as maintained—proof which the company strongly emphasizes as complete and indisputable in its sharp criticism of the amount of accrued depreciation found by the District court in valuing the property."

For it was here, Chief Justice Hughes found, that the arguments of the company in its anxiety to keep its fair property value high returned to plague it when it sought to make its depreciation requirements high.

The wide divergence between "existing depreciation" on the basis of the company's own 9 and 8 per cent depreciation claim, and the amounts it showed as the depreciation reserve allocated to the intrastate business in Chicago were shown. For 1923 "existing depreciation" was $11,992,000 while "depreciation reserve" was $26,797,000; for 1931 the figures were respectively $15,828,000 and $48,362,000.

The opinion recalled explanations by company's counsel as to why this was so. But, said the court:

"Giving full weight to these consid-

(*Please turn to page 26*)

6 definite reasons

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When used with modern transmitters having a drain of 100 milliamperes an hour, two Eveready Air Cells, connected in series, will provide 6000 working hours of "peak" transmission.

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Shipped dry, Eveready Air Cells are activated for service by merely filling with ordinary drinking water.

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erations, we are not persuaded that they are adequate to explain the great disparity which the evidence reveals.

"Rather it appears that the depreciation reserve to a large extent represents provision for capital additions over and above the amount required to cover capital consumption.

"The point as to the necessity of the annual charges for depreciation made or claimed by the company, in order to avoid confiscation through the rates in suit. On that point the company has the burden of proof. I find that this burden has not been sustained. Nor is the result changed by figuring the allowances at the somewhat reduced amounts fixed by the court below.

"The case has long been pending and should be brought to an end. The company has had abundant opportunity to establish its contentions. In seeking to do so the company has submitted elaborate estimates and computations, but these have overshot the mark. Proving too much, they fail of the intended effect.

It is not the function of the court to attempt to construct out of this voluminous record independent calculations to invalidate the challenged rates. It is enough that the rates have been established by competent authority and that their invalidity has not been satisfactorily proved.

"The decree below is reversed and the cause is remanded with direction to dissolve the interlocutory injunction, to provide for the refunding, in accordance with the terms of that injunction and of the bonds given pursuant thereto, of the amounts charged by the company in excess of the rates in suit, and to dismiss the bill of complaint."

Decision Seen As Reversal of I. C. C. Rulings

By R. C. RENO

Because of the possibility that a final decision might require it to refund to Chicago telephone subscribers, the difference between the rates collected and those ordered, the Illinois Bell Telephone company followed its always efficient business practices and throughout the period of the above rate case has made provision to do so. The records of the company are complete and there should be no difficulties in making the refunds aside from the time required for clerical work.

The payment of refunds will be under the direction of the District Court after the mandate of the Supreme Court is sent to it at the end of 30 days.

It is the opinion of many newspaper and financial writers that the Supreme Court decision on charges and accounting for depreciation is a complete reversal of the regulatory rulings under which telephone companies have operated in the past. This view is substantiated by the fact that Chief Justice Butler, in his concurring opinion, after quoting the Interstate Commerce Commission rulings, said "The evidence requires a finding that the company faithfully followed the prescribed system. The state commission continuously watched over the company's handling of the depreciation reserve account."

The allowances set up for depreciation by the Illinois Bell Telephone company have been published in its annual reports and its whole system of depreciation accounting has often been reviewed by regulatory bodies and courts.

The Supreme Court decision concludes the long drawn-out case, unless, after further study of the decision, the Illinois Bell Telephone company decides to ask for a rehearing. It has 30 days from the date of the decision to ask for a rehearing.

WRITE CONGRESS ON JOHNSON BILL

"For some time there has been pending in Congress what is generally known as the Johnson Bill (Senate Bill No. 752). We called attention to this Bill in April 1933, and again in February of this year. The Johnson Bill, as passed by the Senate and referred by the House of Representatives to the House Judiciary Committee, provides that appeals cannot be taken by telephone and other utility companies from decisions of the State Commissions direct to the Federal Courts; but such appeals must go through the State Courts in accordance with State laws, and the appeal can only be taken to the Federal Court from the State Supreme Court.

"The House Judiciary Committee held a hearing on the Bill on March 1, at which representatives of the telephone companies, utility companies, the American Bar Association and the owners of telephone and utility securities appeared to protest against the terms of the Bill, as it deprived the companies, and in that way the owners of securities, from appealing to the Federal Court direct from the State Commissions. In view of the different procedures in the State Courts and provisions for appeals from State Commissions, and in view of the sometimes arbitrary orders of those Commissions, it was considered by all these protesters as unfair and contrary to the provisions of the United States Constitution that anyone was to be denied his day in the Federal Court except through the sometimes difficult and tedious procedure through a series of State Courts.

"The majority of the House Judiciary Committee, after due consideration, has reported out an amended Bill (still Senate 752) which is now upon the House Calendar and will probably be up for consideration within the next two weeks. Under this amended Bill so reported by the majority of the Committee, provision is made that appeal can be taken to the Federal District Court upon the record of the proceedings before the State Commission. The Federal Court may receive additional evidence if it is apparent that this proposed evidence was offered to the Commission and the Commission refused it and the Federal Court considers this additional evidence material to the case, or if the State Commission refuses to certify the record made before it to the Federal Court.

"One complaint that has been made by some of the State Commissions has been that some utilities after starting a case in a State Court have begun action on the same case in a Federal Court. The majority of the Committee provide that this is not to be done.

"Some of our companies in considering this proposed legislation have said that while they were in principle objecting to being deprived of their right to go to the Federal Court from the State Commission, yet in practice it had seemed too expensive—both in time and money—to go to the Federal District Court and there make an entirely new case, making use of none of the record made before the State Commission. This is a burdensome requirement and prevents the smaller companies from appealing to the Federal Courts and compels them to go through the procedure in the State Courts, or to refrain from making an appeal to any court. Under the proposed procedure, this difficulty is obviated because the record made before the State Commission can be used before the Federal Court and there is not an entirely new trial. It seems to us that this is the fair and proper procedure to be followed. It will require the telephone company to be very careful in submitting its case to the State Commission, and the State Commission to be very careful in presenting its side of a rate case; and thereby both parties will be saved unnecessary time and expense should an appeal to a Federal Court seem advisable.

"Few of our companies have found occasion to appeal to a Federal Court or to State Courts, but probably there are none of them but what want the right of appeal in the simplest, sanest way possible. We suggest that the members of the Association telegraph their Representatives and Senators, urging that the Bill as recommended by the majority of the House Committee be passed, and that the Johnson Bill as passed by the Senate be not adopted. The Bill is now up for consideration and *immediate action is necessary.*"

U. S. INDEPENDENT TELEPHONE ASSOCIATION
By F. B. MacKinnon, President.

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For the first time in three years, Spring Telephone Construction begins to approach its normal importance . . . The growing needs of recovery imply increased telephone service . . . Graybar, with its 60,000 electrical items, can help supply every telephone need. And it backs every item with a reputation for quality that goes back 65 years to the beginnings of the telephone industry.

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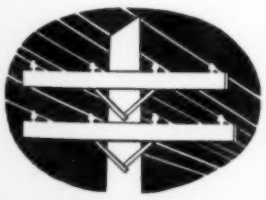
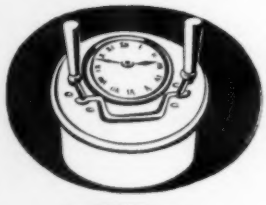
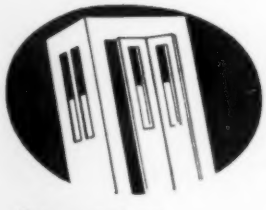


LINE MATERIAL . . . A single insulator. Or miles of pole line. Graybar can supply construction materials and tools for *any* telephone need. Quickly and economically.



EXCHANGE EQUIPMENT . . . Exchange equipment of many types is readily available from Graybar. Equipment from Graybar is standard, quality equipment. Write us.



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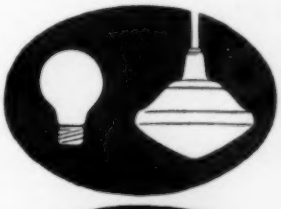

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RAMBLEGRAPHS

By J. A. Smith

Before leaving New York we visited the offices of William J. Wardall and Harold V. Bozell, president and vice-president, respectively, of the Associated Telephone Utilities company, located on Broad street. They informed us that increased business and retrenchment had enabled them to gain ground and they were more optimistic over the future than for some time.

* * *

The Coffing Hoist company at Danville, Illinois, reports probably the greatest increase in re-employment of any manufacturer in the telephone group; recently he stated that he had increased his working force to seven times as many as one year ago. Mr. Coffing reports his company had greatest gross business during February and March than at any time since entering business.

* * *

While in Elkhart, Indiana, Rambler called upon John Troyer, local manager of the Elkhart Telephone company, operated by the Indiana Associated Telephone company with headquarters at Lafayette. In a conversation he stated that the Elkhart exchange had shown a consistent gain in installations during the past eight months with the exception of one month. He feels that conditions will continue as at present for the coming few months, beyond which we would not venture a guess.

* * *

Some time ago Rambler carried a paragraph to the effect that Secretary of Labor Perkins suggested to the shoe manufacturers of the east that considerable new business could be secured by said manufacturers if a campaign should be inaugurated to make the South shoe-conscious. They learned secretary intimated that large numbers of southerners were not wearers of these items, feeling that they were luxuries which could be dispensed with. This suggests a plan of reciporcity by at least one southern gentleman in a letter to Rambler.

* * *

It is suggested by this southern gentleman that the secretary reciprocate by having the south make the effete east "cow-pea and corn-pone" conscious. If the masticators of Boston baked beans could be made to realize that "cow-pea-pot-likker" were far superior to the bacon-and-bean product of the tea party town, the sales of corn and peas would be greatly increased and thereby make the South able to don the luxurious foot-wear. There are other economic advantages to this "dunking" idea, suggests the southern gentleman, namely, in the corn-pone-pot-likker menu less silverware is necessary, and this silverware could be coined into silver dollars to pay transportation on the products, thereby eliminating the necessity of money entering into the plan in any way. This would be a clincher for the bargain as far as the south is concerned, according to our informer.

* * *

It is pointed out that "Hooy" Long of Louisiana could be secured to lay the matter before the eastern half of the country; as an assistant, if such was needed, Alfalfa Bill Murray, governor of Oklahoma, might be conscripted to present the hog-jowl and poke salad side, which should throw the preponderence of evidence on the side of the south. Shoe manufacturers might secure the services of Primo Carnera and show that by confining the feet to a limited area, a larger crop would result. It has always been a problem of the southerner to keep the under extremities of the flat-footed son of Ham off the growing crop, and this might be the answer. We suggest that the Secretary of Labor give this consideration.

* * *

F. R. McBerty and wife returned last month from a tour of Europe studying conditions in several countries in regard to telephone progress. Mr. McBerty reports that greater strides are seen in the countries to the east of us than in our own America. Everyone understands of course that they will have to go a long way to catch up with the United States, but at that we should not let other countries outstrip us too far in the matter of recovery.

* * *

Roscoe Pontius of the Rochester (Indiana) Telephone company reports that their company is making progress along with others. Since the death of Henry Barnhart, former manager of that property, Roscoe has been put at the helm of this progressive company. For a number of years he has been active in association affairs in Indiana and the association in that state would do well to keep Mr. Pontius in harness by placing him in more responsible positions in association affairs.

* * *

J. H. Welker, who hails from Canton, Ohio, spent the winter in Florida recuperating his health; returned in time for the Columbus convention and brought proofs of his catches in the fishing contests of the southern frontier. Kodak pictures were mute evidence that Mr. Welker did not remain idle all the time he was in Florida. He was looking stronger than ever and returns with a determination to do more and better work for his clients.

* * *

Evidence of returning happiness was demonstrated on the floor of the Ohio convention during the two days' session last month. Every one seemed happy and talked of improvements in contemplation in his section. It's always a pleasure to attend the Ohio convention.

* * *

T. L. Leonard of the Scotia Telephone company at St. Louis seems well pleased with the progress toward recovery his exchanges are making in Missouri. Mr. Leonard has shown a co-operative spirit among his patrons that has won for those properties the good will of the subscribers. We expect to show in future issues of TELEPHONE ENGINEER some of the things this organization has done to bring company and subscriber closer together.

* * *

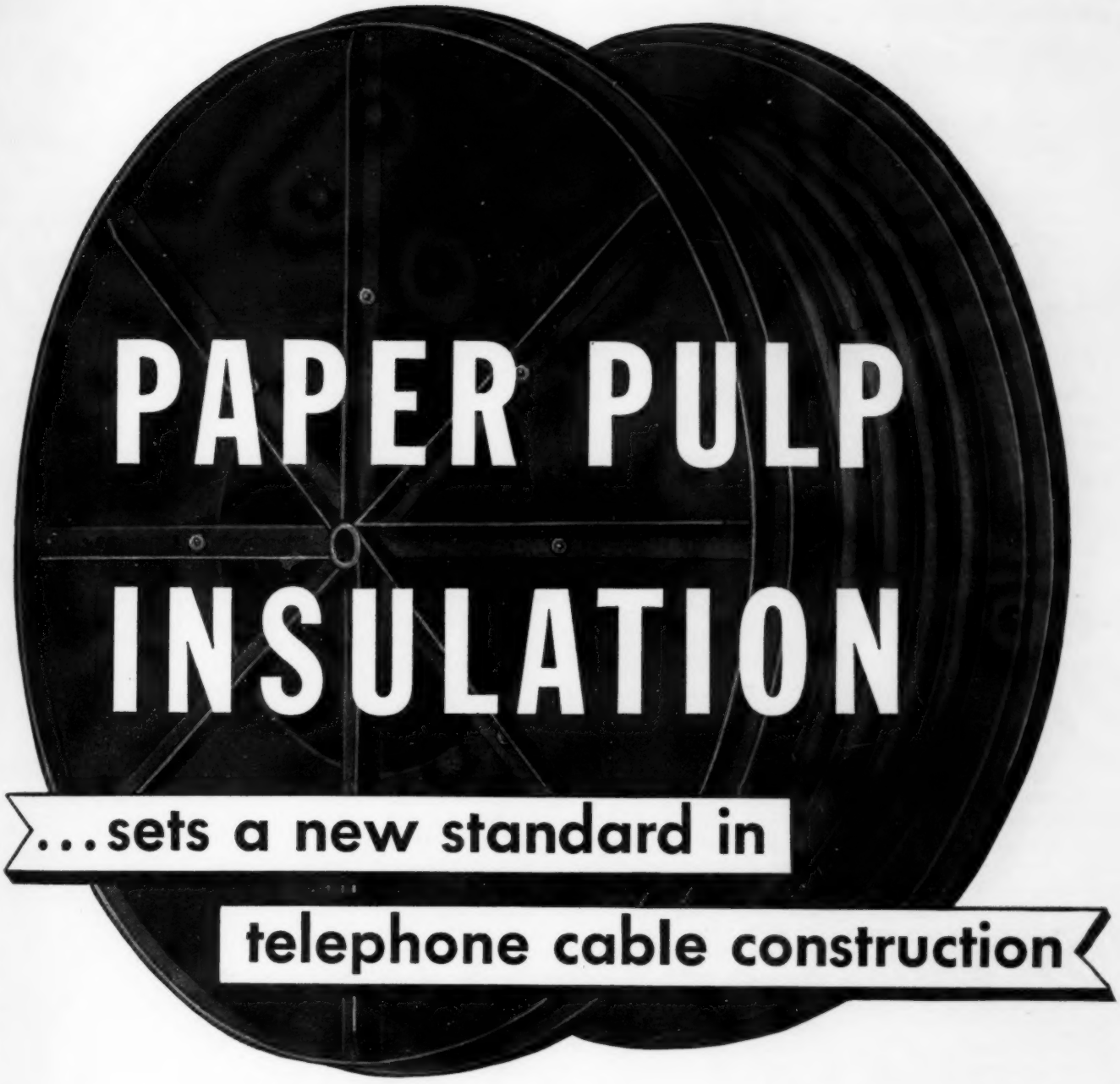
The Chance company of Centralia, Missouri, recently called in all of its salesmen throughout the country and canvassed the business outlook from all sections. They made encouraging reports of business revival and expected greatly increased sales during the coming year. The company expressed the belief that business recovery was near and stated that increased business was already in evidence from many sections of the United States, and even in other countries.

* * *

And so the story goes. Wherever Rambler stopped he found encouragement on the faces of those who have investigated conditions and who are firm in the belief that another six months will prove more profitable than the last half of 1933 and a steady gain for the year.

* * *

Rambler and wife are in Texas visiting relatives and fishing. Some of the largest fish in Lake Worth have been pulled to the surface, only to drop back out of sight upon observing the holder of the line. But, gee, a fellow can't get everything in life. Relatives and friends gave us the glad hand, even tho the finny tribe extended the cold shoulder.



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1—In making this new type cable, high quality Kraft wood pulp encases conductors in a continuous, flexible and strong sleeve of insulation.

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Western Electric

LEAD COVERED CABLE AND TELEPHONE APPARATUS

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IDEAL SYSTEM SERVES HAWAII

(*Continued from page* 17)

tel. This hotel is a unique structure, being built of Red Coral.

The rural sections on the Island of Oahu, where Honolulu is located, is served by five small exchanges located along the main highway which goes around the island, about 95 miles, and which is the scenic route for sightseers. In this rural district are about 1,800 stations. All circuits are metallic No. 10 B & S copper carried on square redwood, round cedar and creosoted fir poles. These are provided with 12-pin crossarms, made of creosoted fir, 12-pound treatment. The 12-pin crossarm lends itself readily to phantom circuits, carrying six physical and three phantom circuits.

The rural service is magneto party line equipped with 1,000 ohms bridged and a one m.f. condenser in the receiver circuit. All lines are transposed; straight code ringing is used throughout. The grounded line is a rare exception. The interior of Oahu Island is mountainous, hence about 90 per cent of the rural plant is near the highway.

Many of the large sugar and pineapple plantations have their own systems, which in turn are connected to the telephone system through trunks. A large number of circuits are leased to the R. C. A., U. S. Army & Navy, Mackay Radio, Dollar Steamship Line, etc., as these control the Trans Pacific Radiotelegraph stations. The O. R. & L. Railway also lease their trans-dispatching lines from the Mutual company.

The magneto plant is connected to the automatic system through a toll board in the main office. The initial period for a toll message is five minutes, varying from five to 30 cents, according to distance.

In addition to the above described system for the Island of Oahu, the Mutual gives service by wireless to six other islands, Kauai 824 stations, Molokai and Maui 1,765 stations, and Hawaii 2,630 stations; also Lanai and Kahoolawe by wireless connection. The Island of Oahu has 19,169 stations. There are seven islands in the Hawaiian group and all are developed except Nithau.

This system of connecting up the islands was begun in 1889. It had its beginning with a submarine cable between the Islands of Oahu and Molokai. Channel conditions proved this to be impracticable. This failure drew the attention of Marconi in 1899. The wireless system was actually put into service March 1, 1901. Development was slow and tedious during this period, but by January, 1904, a distance of 172 miles had been bridged. A record for that early date. The greatest difficulty encountered was mountain screening. This was overcome by raising the transmitting power and improvements in receiving and transmitting instruments.

Communication was established between ship and shore early in 1908. The equipment used was a 10 K-W spark set. In the same year (night) signals were heard from San Francisco, a distance of 2,100 miles, October 15, 1908, and was a record at that time.

The Inter Island and Ship Radio Telegraph System is the oldest commercial Inter Island system in the world. The main exchange on the Island of Hawaii is Hilo, and six other sub-stations. The development of the Hawaii Island system shows four companies operated on the island. In March, 1913, three of these were purchased by the Mutual Telephone company.

Reconstruction began at once, trunk lines were built and a toll system installed. On January 1, 1920, the fourth was bought. All four were organized under the title of the Hawaiian Telephone company. In 1925, this charter was surrendered and it is now the Mutual Telephone company. The automatic system has been introduced in the City of Hilo. The Island of Maui has five exchanges. This system was taken over in 1918.

Kauai has five exchanges and was taken over in 1928. It is noted that the rural exchanges are comparatively small. This is due to the remoteness of the districts.

The entire system in the short space of 20 years has been consolidated into one complete simple and unified service, making it one of the finest defense systems in the world. This work is being carried on through co-operation between the Mutual Telephone company and the Radio Corporation of America and the R. C. A. Victor company, Inc. At the present time frequencies of 40,000 cycles (7.5 meters) and a beam antenna system is used. This will culminate in a telephone service that will embrace all the islands known as the Territory of Hawaii.

"What wonders God, through man, has wrought." The human genius, in developing this marvelous system, consists of a long list of pioneers among whom are the present officers of the company. They are J. A. Balch, president; J. A. Galt, vice-president; F. C. Atherton, vice-president; F. G. Hummel, vice-president; W. C. Avery, treasurer; J. M. Pierce, secretary, and directors R. A. Cooke, John Waterhouse, W. F. Frear, L. E. Clark and P. E. Spalding.

The present general manager, F. G. Hummel, and his assistants were coworkers with the writer in developing the automatic telephone system in California and have had a very large and varied pioneering experience. The Mutual company has not suffered from the present world-wide depression and is steadily gaining in stations and has paid regular dividends. As an example of the progressiveness of this pioneer company, it recently spent $1,000,000 in improvements. About 80 per cent of the stations are now operated by the Strowger Automatic system. Rotary system of billing subscribers was begun early in 1931, bills being issued at intervals of 10 days during each month.

A profitable merchandise department in radio equipment is also operated. They also have a pension system for officers and employees. These employees are more than mere workers or telephonists, they are artists. Telephone work is not merely their business, it is their hobby. They love their work. This then is the secret of their having built up one of the finest and most complete transmission systems in the world. Some day you must see these things for yourself—you must go to Hawaii.

LINE & DESK: QUESTIONS AND ANSWERS

(*Continued from page* 18)

A.—These clamps are highly desirable for use with parallel drop wire but by no means a necessity. The parallel drop wire may be tied in on a single groove knob or one groove of a two groove knob with a piece of wire in the manner usually employed with twisted pair.

Q.—What is the largest size pipe which may be pushed into the ground for telephone use, any distance with any degree of accuracy?

A.—Ordinarily three-inch pipe is the largest required for telephone work. When using an approved type of pipe pushing machine a pipe of this size may be pushed into the ground for a distance of at least 50 ft. with a variation of only a few inches. I have known many cases where pipes have been pushed 75 to 100 ft. and come out at practically the point desired. To be successful with pipe pushing the machine must be set accurately and the nature of the soil must be such that will make pipe pushing possible. Soil mixed with large boulders or where other obstructions are encountered, difficulty or total failure may be expected.

ENCOURAGING REPORT

The York district of the Lincoln Telephone company had an increase of 161 telephones during March. This means that 161 persons or firms, who had felt the pinch of the depression and ordered out their telephones, have ordered them back. It does not need an expert economist to know what that means.

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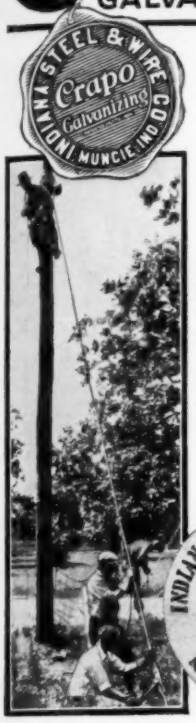

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If Purchasing Agents Knew the FACTS-

THERE would be no hesitancy in the choice of pliers if Purchasing Agents were familiar with the actual FACTS about Vacuum Grip Lineman Pliers.

First and last is their Economy, due to their wonderful wearing qualities. An unanswerable argument in their favor. The pliers in this No. "58-R" Series outlast half a dozen pairs of ordinary pliers.

The steel we put into them—the toughest tool steel alloy ever produced by metallurgists—is one of the reasons for their phenomenal durability. Another is the extra factor of strength in their construction.

Many special features, such as the tapered nose for cramped quarters, the double edged cutting blades, the deep-cut grippers and insulation stripper, the easy-riding joint and the wide-spread handles opening at a touch of the little finger, all help to lighten the work of the lineman, adding to his speed and efficiency.

You owe it to yourself and to your Company, Mr. Purchasing Agent, to learn the facts about these rugged, precision-built pliers by a practical try-out in everyday service. Order two or three pairs of the sizes you use most, and subject them to running tests with any other make or makes of pliers on the market. You will be astonished by the results. And by the amount of money saved for your company!

Write for prices and full particulars.

FORGED STEEL PRODUCTS CO.
Newport, Pa.

Vacuum Grip REG. U.S. PAT. OFF. **Pliers**

Built *UP* to a Standard—Not *DOWN* to a Price

OVER ONE MILLION IN USE

TELEPHONE FUTURE BRIGHT IN OHIO

ENCOURAGING reports of a general upswing in telephone business in Ohio formed the keynote of the 39th annual convention of the Ohio Independent Telephone Association at Columbus, Tuesday and Wednesday, April 17 and 18.

President Herman E. Hageman called the first session to order by introducing Arthur L. Evans, president, Columbus Chamber of Commerce, who welcomed the telephone men to the city. Dr. C. L. Jones, Athens, responded for the association.

President Hageman, in his annual address, discussed certain aspects of the economic situation including the many experiments of the Roosevelt administration.

Secretary-Treasurer Frank L. McKinney told of the association's activities in protecting the interest of the Ohio telephone industry in his annual report.

President F. B. MacKinnon, United States Independent Telephone Association, then reviewed the national situation and discussed the events now taking place in Washingon and how they effect the telephone industry.

In an interesting address, Randolph Eide, president of the Ohio Bell Telephone company, Cleveland, told of the importance of the telephone in the social and economic life of the world, government regulation, rates, taxes, etc.

Mr. Eide expressed optimism for the future of the telephone business and believes that the public as a whole is in sympathy with the work carried on by the industry, although there is a small minority which is attacking it.

At the annual banquet Tuesday night, Governor White and Ohio Public Utilities Commission members were guests. Governor White spoke briefly relative to the confidence which has replaced fear in our economic life.

J. Warren Safford, president, Troy Telephone company, was the first speaker on Wednesday morning's program. His subject was "Keeping Our Plants Fit for Service."

Following Mr. Safford's address there was a demonstration of the radio- telephone service for ship-to-shore communication for the Great Lakes, to be inaugurated soon by the Lorain Telephone company.

A conversation was held with the steamer "Atwater" stationed at the Cleveland ore docks on Lake Erie over land telephone lines to Columbus and to Lorain by radio. Loud speakers were used to bring the conversation to those listening at the convention.

"Some Ohio Campaigns for New Business" was the topic of a discussion, opened by Gustav Hirsch, well-known Columbus consulting engineer, who has charge of the campaign conducted by the Mansfield Telephone company.

The Mansfield company started a continuous campaign last September and the campaign will continue until all of the lost business has been regained and 3,000 additional stations above the maximum the company has had, or a total of 15,000 telephones. This figure is expected to be attained by next spring.

The turn from a loss to a net station gain took place in July, 1933, with a net gain of four stations. From that time to April 15, 1934, there was an accumulated station gain of 1,297 stations.

The new business department began work on September 15, and the station gain that month was 87, against 25 in August. October showed 114 stations gained, November, 201 stations, and December, 254. In January there was a net gain of 126 stations, in February, 204, in March, 221, and April to the 15th, 61 stations.

"Mansfield does not know a depression," Col. Hirsch said. "The company is getting subscribers in the town and in the country. The company had 11,058 stations at its peak and 9,386 at the low in June, 1933. On March 31, 1934, it was 10,553. That is the story of the Mansfield company, and the same results can be accomplished anywhere if they are gone after."

W. C. Henry, general manager, Northern Ohio Telephone company, Bellevue, told of the success his company has experienced in sales campaigns and told advantages of conducting an every day campaign instead of the usual short drive based on enthusiasm alone.

Frank Binkley, general manager, United Telephone company, Bellefountaine, reported results of campaigns conducted by his company.

'Inflation and Telephone Rates" was the subject of an address by Frank C. Dunbar, Columbus attorney.

The convention program was concluded with an address on "The Relation of Taxes to Payrolls and Dividends" by W. C. Henry. Mr. Henry flayed the rising taxes levied against public utilities and declared that rates cannot be increased to make up any additional tax burden. He said that the telephone industry must wage an aggressive publicity campaign against increased taxes and for decreased cost of state government.

He declared that telephone companies must open up and tell their story to stockholders, subscribers and the public. He said:

"There are some ten million owners of public utility stocks and bonds in this country representing a utility industry with 28 billions of dollars of invested capital. More than half the population of the United States is affected, either directly or indirectly, by the prosperity of the public utility industry. Sixty-five million holders of insurance policies, the depositors in savings banks, colleges, hospitals, and church societies with their money invested in utility securities, are affected as well as those of us who own one, five, or one-hundred shares of stock in our local telephone company.

"As part of one of the leading industries of this country, telephone companies are entitled to share equally with other industries in national recovery and in renewed prosperity. That, however, will not be possible so long as additional taxes are added to a tax bill which is already disproportionate."

The final session of the meeting was taken up with a discussion of voice and electric waves and their amplification and transmission over wires and radio. The discussion concluded with a demonstration of transatlantic telephony. The speaker was Dr. J. O. Perrine, associate editor of the *Bell System Technical Journal*.

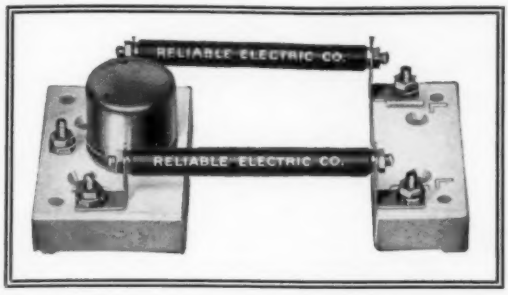
The following were elected directors of the association: W. L. Cary, Newark; H. O. Dutter, Elyria; Herman Hageman, Lorain; Gustav Hirsch, Columbus, and R. B. Still, Portsmouth.

The directors elected the following officers: president, W. C. Henry, Bellevue; vice-president, Mr. Cary; secretary-treasurer, Frank L. McKinney.

102 COMPANIES GAIN IN FEBRUARY

The interstate commerce commission reports that 102 large telephone companies in February had gross revenues of $78,532,868, as compared with $76,062,417 in the like month last year. Net operating income for the month was $15,799,402 against $13,100,350. For the first two months of this year the gross amounted to $160,096,209 and net operating income was $32,514,815 as against $155,791,372 and $27,124,170, respectively, in the like two months of last year.

Reliable



977 HH ARRESTER

LISTED AS STANDARD BY THE UNDERWRITERS LABORATORIES.

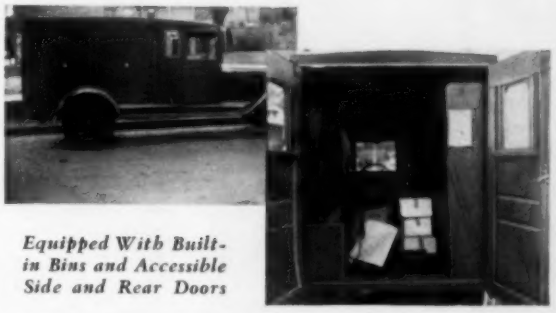
ADOPTED BY MANY OF THE LEADING TELEPHONE COMPANIES IN U. S. AND ABROAD.

Reliable Electric Company

3145 Carroll Ave. Chicago, Ill.

WHILE THEY LAST

29-1½ Ton Ford Telephone Maintenance Trucks at $185 each, FOB, Chicago



Equipped With Built-in Bins and Accessible Side and Rear Doors

These trucks were formerly owned by a telephone operating company. They are known as "Group Installation" trucks and are especially designed for telephone maintenance work.

They have been thoroughly overhauled by our expert mechanics and are in first class operating condition.

We are experienced in truck fleet shipping all over the United States. This assures prompt, efficient and guaranteed shipments to Independent telephone companies located in any part of the country. We will accept limited trade-ins.

Don't pass up this wonderful opportunity.

FRYER BROWN, INC.
Authorized Ford Dealers

5301 LAWRENCE AVE CHICAGO, ILL.

HANDSET TELEPHONES

will replace all other types! The present trend is to Handsets. Why resist the demand?

Now is the time to buy while the special handset rate is available and may be applied toward the purchase price.

The public will eventually demand this type of telephone and to delay in modernizing your plant, by installing handset telephones, is to risk the loss of this revenue now available.

LEICH handset telephones are beautiful in appearance and unsurpassed for quality of transmission and receptfion.

Code No. 70 Magneto.
Code No. 62 General battery.
May be used with any conventional bell box.

Be your own judge and order a LEICH handset telephone today. Sent on 30 days' trial.

Telephone bulletin No. 165 describes all LEICH telephones. Have you a copy?

LEICH ELECTRIC CO., GENOA, ILLINOIS

TUCKER RE-ELECTED BY KANSAS GROUP

The 34th annual convention of the Kansas Telephone Association was held April 12-13 in Hotel Kansan, Topeka.

Fred Coulson, executive vice-president and secretary of the United Telephone company, Abilene, presided at all sessions in the absence of President Samuel Tucker.

Warren S. Miller, general manager, Southwestern Bell Telephone company, Topeka, welcomed the delegates. Following Mr. Miller, Herb. Couch, secretary, gave his and the treasurer's report.

At the annual election J. B. Haley, Western Telephone corporation, Kansas City; Walter Pedigo, Southwest Telephone company, Pratt; Foster Lamming, Suburban Telephone company, Tonganoxie were elected directors to serve three years. Fred Cross, Wilson Telephone company, was elected to serve an unexpired term of one year.

The annual president's address was given by Mr. Coulson. The keynote of Mr. Coulson's address was that telephone companies must adopt new ideas. He declared the industry cannot grow if the service is allowed to become antiquated.

T. A. McNeal, editor, Kansas Farmer, entertained his telephone listeners with an address, entitled "Seriously".

National telephone affairs were reviewed by C. C. Deering, secretary, United States Independent Telephone Association. He discussed the NRA and the proposed communications commission, both of which have been discussed in detail in past issues of TELEPHONE ENGINEER.

"State Regulation" was the subject discussed by M. J. Healy, Topeka attorney and formerly connected with the Kansas Service Commission.

B. C. Burden, transmission engineer, Lincoln (Neb.) Telephone and Telegraph company gave a demonstration of the cathode ray tube and its connection with television.

The roof garden of the hotel was the scene of a dinner dance Thursday night which was enjoyed by all. In charge of entertainment were Foster Lamming and Sewell Black.

The Friday morning session was opened with an address on "Depreciation" by E. T. Mahood, Southwestern Bell engineer. Following Mr. Mahood on the program was an open forum which was led by Glen E. Gaston, Kansas Corporation Commission, F. M. Browne, Western Telephone corporation and M. R. Campbell, Inland Telephone company. The subjects discussed were accounting, collections and new business.

The following officers were elected at the executive dinner Friday noon: president, Samuel Tucker; executive vice-president, Fred Coulson and secretary, Herb Couch.

WISCONSIN ELECTS GALLON

On Tuesday, Wednesday and Thursday, April 24, 25 and 26, the Wisconsin Telephone Association and the Wisconsin Locally-Owned Telephone Group held a joint annual convention at Madison.

During the first day of the convention, these two groups held their business sessions. At the Locally-Owned Group meeting Chairman Herman E. Hoerl, Marshfield, told of the year's work. Secretary Harry A. Price's report dealt with activities of the group relative to legislation. Treasurer A. H. Bowden then gave his report.

The following were elected officers: chairman, Mr. Hoerl, vice-chairman, T. H. Sanderman; president, Charles Wiswell, Elkhorn; secretary, Mr. Price; assistant secretary, L. H. Lamkins, Manawa; treasurer, Mr. Bowden.

At the association's meeting, President Walter Gallon, Antigo, gave a report on the association's condition and Secretary A. H. Bowden reported the activities during the past year. Treasurer W. L. Smith gave his report and then resigned as treasurer.

Following the reports, it was decided to employ a field agent to visit telephone companies of the state. John A. Platt, a former secretary of the association, was selected for this position.

The directors then elected the following officers: president, Mr. Gallon; vice-president and treasurer, W. F. Goodrich, La Crosse; secretary, A. H. Bowden, Almond.

President Gallon opened the first general session Wednesday morning by announcing the newly elected officers, after which he gave his annual address. President Gallon discussed NRA, public relations and telephone financing.

C. C. Deering, secretary, United States Independent Telephone Association, then reported "What is going on in Washington," discussing the NRA code, communications bill, Wagoner labor bill and the Johnson bill.

The Wisconsin unemployment insurance law, which becomes effective July 1, was briefly discussed by Herman Hoerl.

"Interstate and Intrastate Regulation Based on New Communications Bill" was the subject of an address by Prof. H. R. Trumbower, University of Wisconsin and a former member of the Wisconsin Railroad Commission.

The Wednesday afternoon session was opened by H. B. MacMeal, Chicago, who spoke on "Long Ago Yesterdays." Mr. MacMeal stated that the "History of the Independent Telephone Industry," which he is preparing, will be published around July 1.

The next speaker was K. G. Williams, Wisconsin Telephone Company, Milwaukee, who spoke on "Selling Servcie."

Alfred L. Godfrey, attorney, State Long Distance Telephone Company, Elkhorn, discussed the state unemployment insurance act.

At the annual banquet entertainment was furnished by the Lindbergh Junior Optimist Club, Madison. The banquet and program was enjoyed by all.

Henry Studussy, Fidelity Investment corporation, Milwaukee, opened the Thursday morning session with a discussion on "Practical Application of the Unemployment Insurance Act."

Thursday afternoon, F. M. McIniry, General commercial superintendent, Wisconsin Telephone company, spoke on "Collections."

A. T. & T. STOCKHOLDERS UPHOLD SALARIES

The stockholders of the American Telephone and Telegraph company signified approval of the salaries paid to their officials at the annual meeting held by the company on April 18. President Walter S. Gifford, found it unnecessary to say a word in defense of his remuneration, several stockholders speaking in his behalf. Later the secretary read a statement by the directors at a recent meeting indicating that if they could get "better men by paying even more money it would be wise to do so."

Answering a stockholder who quoted a report that Mr. Gifford had sold one-half of his holdings of stock in the company, Mr. Gifford replied that he had never sold any share he had ever bought, except during the war, when he sold ten shares "to get money to live on." Of 18,662,275 shares outstanding, 10,615,742 were represented in person or by proxy at the meeting, and were voted virtually unanimously for re-election of the retiring directors.

GROENER NAMED

John Groener, American Telephone & Telephone company, is directing a fund-raising campaign in the communications field in behalf of the Citizens Appeal for The Salvation Army. Mr. Groener is Chairman of the Communications Division of the Trade & Industry Committee which is headed by David Sarnoff, President of the Radio Corporation of America.

NEW SELF-CONTAINED MONOPHONE

AUTOMATIC Electric company has just announced the perfection of a new self-contained desk Monophone No. 34-A-3, to supplement its already extensive line of modern handset designs. The new telephone is shaped along compact, modern lines, yet it is not so modern in design as to be in the least radical or disturbing in any way to the most conservative minds. It represents, in fact, a combination of standardization, durability and modern beauty.

The new Monophone is completely self-contained, requires no ringer box and contains within itself every element of equipment necessary for any type of central battery service. It can be used in connection with either automatic or manual exchanges, for straight line or harmonic ringing, and can be supplied with either bridged or grounded ringers. All of the equipment, including ringer, condensers, induction coil, etc., are standard full sized parts, with operating efficiency equal to that of the company's regular line of Monophones. While the new model is very compact, no sacrifice whatever has been made in efficiency or in accessibility of the parts, it is said.

The same telephone can be used for either automatic or manual service, the only difference being that the manual model is equipped with a neat number plate in place of a dial.

It is available with the same two standard circuits customarily furnished with other standard Monophones, it is announced. One of these is an exclusive anti-side tone booster circuit using a three-winding induction coil, and the other is an anti-side tone booster circuit which embodies the induction coil in the receiver itself, making the use of a separate induction coil unnecessary. Either circuit can be furnished for metallic or grounded ringing. The ringer is of the standard polarized type, and is available for either individual line service or for any of the standard harmonic frequencies.

In designing the new telephone, the manufacturers had in mind in particular, two commercial developments of growing importance. The first is that the demand for handset telephones has shown evidence of a marked increase during the last few months and it seems likely that this demand will become heavier as time goes on. The new telephone has now amplified the company's line of handset telephones, and gives telephone companies an opportunity to offer their subscribers a new and more beautiful instrument than any now available. The second point is the desirability of meeting the demand for a complete self-contained telephone which does not require a separate bell box, and one which is universally applicable to all types of central battery service.

COOPERATES WITH RURAL LINES

A prominent telephone company in the middle west showed their interest in and desire to cooperate with rural telephone lines in making an offer to let the farmer subscribers make poles to pay for their dues. Proof that this cooperation built up goodwill for the operating company is shown in the following letter received from the secretary of the rural lines:

"I am writing you in regard to our telephone line No. 4 of which I am secretary.

"We cannot express our thanks of how well we appreciate your letting us make poles to pay our dues on 'phone line. As you know we farmers are pretty hard hit for money. We as a farmer line are all proud of our line and of the —— Telephone Company for showing us courtesy in this respect.

"As I am secretary of this line it gives me the privilege of expressing our thanks to you, as we think "ole" times are coming back again."

New

Automatic

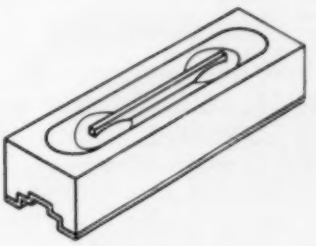
Electric

Self-contained

Monophone

COOK

TRUE GAP DISCHARGERS



WILL NOT GROUND THE LINE

A postal card will bring you one of these Maintenance Savers.

COOK ELECTRIC CO.

2700 Southport Ave. CHICAGO

Convert Your Old Parts into New Telephones at Big Savings

Make Use of Suttle Re-manufacturing & Repair Service

Send in your old parts to us and we make them into equipment just like new for the following prices:

Transmitters	64c down to 38c
Receivers	93c down to 83c
Ringers, 1000 ohm	$1.00
Generators	$1.35 to $1.90
Wall Compact Magneto Telephones	$7.75 down to $6.75
Magneto Desk Sets complete	$8.50 down to $7.75
Desk Stands	$3.90 down to $3.25
Common Battery Wall Compacts	$5.75 down to $4.25

SEE OUR CATALOG NO. 27

24-pages of illustrations and full information and prices on these services.

Suttle Equipment Co.

LAWRENCEVILLE, ILLINOIS

W. L. Runzel, President, brings to this organization 44 years' experience in the manufacture of this type of telephone equipment.

Telephone and Switchboard Cords and Wire

May we quote you on your requirements?

RUNZEL CORD and WIRE CO.

4727-31 Montrose Ave., Chicago

The Home of the Perfect Cord

F. A. Bowdle

Public Accountant

185 N. Wabash Ave.

Chicago, Ill.

Box 642 Wheaton, Ill.

A centralized accounting service at lowest rates.

J. R. KEARNEY, JR. IS PROMOTED

Recognizing the efficient and able manner in which he has performed in his many and responsible positions, directors of the James R. Kearney Corporation, St. Louis, recently elected James R. Kearney, Jr., senior vice president of the company.

J. R. Kearney, Jr.

Mr. Kearney started as advertising manager when the company was organized in 1926 and subsequently undertook broader duties and enlarged his responsibilities, including the management of the St. Louis office. His resourcefulness and far sightedness in keeping the company abreast of the rapid developments of the telephone industry later resulted in his election as vice-president and general manager of the entire St. Louis headquarters.

Mr. Kearney was graduated from the Missouri University with degrees of bachelor of journalism and master of arts. He is third vice president of the National Industrial Advertisers' Association, past president of the St. Louis Industrial Marketing Conference and a member of the Electrical Board of Trade.

URGE UTILITIES MAKE STAND IN 'ADS'

A nation-wide advertising campaign in their own defense is urged on public utility companies by Chester D. Tripp, chairman of the executive committee of the American Federation of Utility Investors, Inc.

His plea is contained in a letter dispatched to all utility concerns of the country. Immediate action is necessary, the letter said, to correct the widespread public misinformation which is definite danger to the future of securities owned by ten million utility investors in the United States.

The proposed broadside would take the form of campaigns by individual companies in their local newspapers appealing to "the innate sense of fairness and justice of the public. Such an effort would be supported by the best elements of every community."

"A great deal of the blame for the public's lack of understanding rests squarely on the shoulders of utility managements who have neglected to develop their public relations," Mr. Tripp's letter continued.

"During the early days of utility development mechanical and scientific minds were of the greatest importance. The next step required able financial management capable of enlarging and consolidating the rapidly growing company structure. The industry has now come to the point where public relations are of the greatest importance and the successful management must handle its public in the spirit of mutual confidence and understanding."

He warns that if the prevailing attitude of unfriendliness and distrust is allowed to continue it will result disastrously for the ten million holders of utility securities.

THREE COMPANIES BUY KELLOGG BOARDS

The Oconee Telephone company, Shelby county, Ill., recently replaced its entire central office equipment. A 150 line Kellogg magneto, double drop supervision switchboard, together with a Cook Electric main distributing frame and Kellogg ringing equipment have been installed. John Mickey is president, and Earl Kinney is manager of the company.

The Inter-Mountain Telephone company of Bristol, Tenn., recently placed orders for two Kellogg Masterbuilt switchboards, according to W. N. McAnge, Jr., president. The two new boards are to be installed in the company's Galax, Virginia, and the Erwin exchanges.

Recently a fire occurred at the Toledo exchange of the Casey, Toledo & Neoga Telephone company, with headquarters at Casey, Ill., which destroyed the entire central office equipment.

Working and planning quickly to restore service, O. A. Logue, owner of the company, hurriedly had installed a 1-position, 200 line double drop magneto Kellogg switchboard, together with main distributing frame, ringing equipment and operator's battery.

Where-to-Buy Section

For the convenience of readers of Telephone Engineer

Accounting Systems

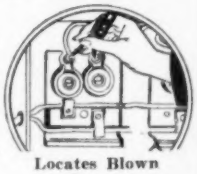
COFFEY SYSTEM & AUDIT CO.
Exclusive telephone accounting since 1907.
Certified Public Accountants.
We install the well-known
COFFEY SYSTEM
Audits—Rate Cases and Special Work.
A Central Accounting Department.
454 Consolidated Bldg., Indianapolis, Ind.

ACCOUNTING
HERDRICH AND BOGGS
Certified Public Accountants
Specializing in Telephone Accounting
and Rate Cases Since 1918.
901-7 Continental Bank Bldg.
Indianapolis, Indiana

Lightning Arresters

DO YOU CARRY A
TEST-O-LITE
In Your Pocket?
It's an Inseparable Companion
to All Electricians

Tests All Voltages 100 to 500 V.
Tests Polarity
Locates Grounds
For a Lifetime of Service $1.50



Locates Blown Fuses

L. S. BRACH MFG. CORP., Newark, N. J.

Telephone Equipment

Transmitter Repair Service

Transmitters completely rebuilt. Highest grade of materials—good workmanship under good conditions with proper tools.

New granular carbon, black velvet baked finish. Proper adjustment and effectiveness rated in decibels @ 50c each. Transmitter backs 10c.

TELEPHONE REPAIR SHOP
Rogers Park Station, Chicago, Ill.
Receivers Rebuilt — Ringer Coils and Generator Armatures Rewound.

Test Sets

1774 Wilson Ave., Chicago, Ill.

LOW RANGE **FUSES**
INSTRUMENT LITTELFUSES 1/100, 1/32, 1/16, ⅛, ¼, ⅜, ½, ¾, 1 and 2 amps., positively protect meters, radios, amplifiers, etc. $100 Protection Guaranty. *Write today for instructive bulletin.*
Littelfuse Laboratories

STROMBERG HAS ORDERS FOR TWO BOARDS

G. A. Scoville, vice-president, Stromberg-Carlson Telephone Manufacturing company, has just announced the receipt of a contract from the Vandergrift Telephone company of Vandergrift, Pa., for the installation of complete central office equipment for the Saltsburg, Pa., exchange.

The Tennessee-Eastman corporation at Kingsport, Tenn., subsidiary of Eastman Kodak company, Rochester, N. Y., has chosen a Stromberg-Carlson switchboard for their new office building now being erected at Kingsport. The contract was made by the Inter-Mountain Telephone company, Bristol, Tenn.

BELL HAS 48,160 NEW STATIONS IN APRIL

There was a net gain of 48,160 in telephones in operation in the Bell system during April, comparing with loss of about 100,000 in the same month last year. This follows a gain of 108,000 telephones in the first quarter of 1934, comparing with a loss of 340,000 telephones in the 1933 period.

April was the eight consecutive month in which the Bell system has gained in number of telephones, and was the best April since 1930, all intervening Aprils having shown losses. It was also the largest gain for any month since May, 1930.

COOK ISSUES FOLDER

Cook Electric company of Chicago recently sent out an interesting and attractive folder on its S-6 protected pole cable terminal, "O" substation protector, No. 7 aerial wire protector and gap discharger.

Attached to the circular, in a cellophane bag, is a Cook gap discharger, made of moulded bakelite with a bronze discharge blade anchored to the bronze top plate.

The company advises that these circulars may be obtained by writing direct to its headquarters in Chicago.

Pocket Detecto-Meter
Volts .0 to 3.
Resistance .0 to 10,000 ohms.
With zero adjust.
$10.75 STEWART BROS.
Ottawa, Ill.

Poles

Finished Cedar Poles
VALENTINE CLARK CORPORATION
St. Paul, Minn.

Telephone Directories

Telephone Directory
ADVERTISING
Write or telephone for proposition
L.M.BERRY & CO.
Call L.D.16 - Telephone Bldg., Dayton, O.

Telephone Engineers

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization and Operation of Telephone Companies
105 West Adams Street
CHICAGO

CONSULTING TELEPHONE ENGINEERS
Rates Financing Accounting Managing
Appraisals and Reports
Radio Program Service Specialists
Construction Contractors
TELEPHONE ENGINEERING AND MANAGEMENT COMPANY
Lima, Ohio

We Help You

Take space on this page and we help you find prospects and make sales. We're both benefitted.

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(Rebuilt by us)

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1168-A, per line	.65
1268-A and B, per line	.65
1269-A, per line	.65
Cook No. 10 (bakelite ins.) per line	.75
Cook No. 10-W, per line	1.35
Cook No. 14 (new), per line	.60
Cook D-67500 (new), per line	.75
W.E. 76-A, 73-A and 67-A heat coils	.10
Lots of 50 or over	.08

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